Suborder EXOCOETOIDEA

Mouth small. Second and third upper pharyngeals with teeth, third pair strongly enlarged, together forming somewhat convex ovoid plate. Fourth upper pharyngeals broad, triangular, with concave upper surface. Pharyngeal teeth on principal plates villiform in front, behind with incisors, their edges transversely expanded and horizontal. Intermediate forms of teeth, many tricuspid, connect above types. Scales rather large.

Analysis of Families

a^1. Mouth cleft narrow, lower jaw usually extended; pectorals not elongated as organs of flight.----------Hemiramphidae.

a^2. Mouth cleft short, jaws not produced in long beak; pectorals more or less elongated as organs of flight.----------Exocoetidae.

Family HEMIRAMPHIDAE

Body very elongate, slender, cylindrical or compressed. Upper jaw short, lower various, usually much produced and toothed portion at base fits against toothed premaxillaries. Maxillary firmly united with premaxillary. Teeth in jaws equal, small, compressed, tricuspid. No teeth on palate or tongue. Gill rakers long. No pseudobranchiae. Air-bladder large, simple, or sometimes cellular. Vertebrae 49 to 55. Scales large, thin, deciduous and cycloid. Dorsal and anal moderate, latter usually like former or modified in viviparous forms, unmodified in oviparous forms. Caudalrounded, truncate or forked, when forked lower lobe longer. Pectoral inserted rather high, usually short, rarely elongate. Ventral moderate or small.

Herbivorous fishes of warm seas, mostly living along shore though a few pelagic. They feed on minute bits of vegetable matter, especially green algae. Like the related sauries, green gars, and flying fishes, they swim at the surface, occasionally leaping or skipping along above. In size they are rather small, the larger rarely exceeding a foot. Though living in all tropical seas some enter fresh water while others live exclusively in brackish or fresh waters.

Analysis of Genera

a^1. Euleptorhamphiane. Body very slender, compressed, band-like; pectoral fin very long; ventral short, inserted posteriorly.-------

----------Euleptorhamphus.

a^2. Body moderately compressed, not band-like; pectoral moderate.

b^1. Dorsal begins above or before anal origin, usually longer than anal.

c

c^1. Hemiramphinae. Caudal forked or emarginate; anal not modified; oviparous.

d^1. Beak without broad cutaneous flap along each side.

e^1. Sides of body mostly convex; air-bladder simple; ventral inserted far before dorsal. ----------Hyporhamphus.

e^2. Sides of body largely flattened; air-bladder cellular; ventral inserted rather close before dorsal.---Hemiramphus.

d^2. Beak with broad cutaneous flap along each side----------

----------Loligorhamphus.

c^2. Zenarchopterinae. Caudal truncate or convex behind; anal sometimes modified; viviparous.

f^1. Lower jaw extended as beak.

g^1. No teeth on beak in its extension before upper jaw.

----------Zenarchopterus.

g^2. Teeth on beak in extension before upper jaw.-------

----------Hemirhamphodon.

f^2. Lower jaw not produced in beak----------Arrhamphus.

Melapedalion.

b^2. Dermogenyinae. Dorsal begins behind anal origin and fin shorter than anal.

h^1. Lower jaw extended as long beak.-------Dermogenys.

h^2. Lower jaw not extended as long beak--Nomorhamphus.

Genus Arrhamphus Günther

Arrhamphus GÜNTHER, Cat. Fish. Brit. Mus., vol. 6, p. 276, 1866. (Type Arrhamphus sclerolepis GÜNTHER, monotypic.)

Body elongate, compressed. Head moderate. Premaxillaries form triangular plate, broader than long. Mandible but slightly protruded before upper jaw, not prolonged into long beak. Maxillary not reaching eye. Teeth in narrow or broader bands in both jaws, minute or moderate and often tricuspid. Gill opening wide. Gill rakers present. Scales moderate or large, rather deciduous. Lateral line low. Dorsal far posterior. Anal opposite and similar to dorsal or more backward. Caudal forked. Pectoral high, less than head. Ventral inserted nearer head than caudal base.

East Indies, Philippines, Australia.

Analysis of Species

a^1. Arrhamphus. Scales before pectoral base small and crowded; ventral inserted midway between snout tip and caudal base; vertical fins without black tips.----------sclerolepis.

a^2. Melapedalion, new subgenus. Scales before pectoral not especially small or crowded; ventral inserted midway between hind eye edge and caudal base; vertical fins with black tips.----------brevis.

Subgenus Arrhamphus Günther

Arrhamphus sclerolepis Günther

Arrhamphus sclerolepis GÜNTHER, Cat. Fish. Brit. Mus., vol. 6, p. 277, 1866 (type locality: New Zealand?). --KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, Math.-Naturw. Kl., vol. 80 heft 1, p. 414, 1879 (Port Darwin; Port Denison). -- GÜNTHER, Introd. Study Fish., p. 621, 1880 (name); Rep. Voy. Challenger, vol. 1, p5. 6, p. 33, 1880 (Mary River, Tiare, Australia).-- MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 184, 1881 (Port Darwin; Brisbane); vol. 6, pt. 2, p. 248, 188 , -- SAVILLE-KENT, Great Barrier Reef, pp. 299, 370, 1893 (Moreton Bay). -- STEAD, Fish. Australia, p. 64, fig. 26, 1907 (New South Wales; Queensland). -- ROUGHLEY, Fishes of Australia, p. 31, 1916 (New South Wales; Queensland). -- MCCULLOCH, Fishes New South Wales, ed. 2, p. 31, pl. 10, fig. 110a, 1927 (Richmond and Clarence estuaries); Austral. Mus. Mem., no. 5, pt. 1, p. 104, June 29, 1929 (compiled).

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Hemirhamphus sclerolepis OGILBY, Edible Fishes New South Wales, p. 175, pl. 44, 1893.

Hemirhamphus krefti STEINDACHNER, Sitzs. Ber. Akad. Wiss. Wien, Math.-Naturw. Kl., vol. 56, pt. 1, p. 26, pl. 1, figs. 1-2, 1867 (type locality: Port Jackson).

Depth 6; head 3-4/5. Snout 2-4/5 in head from snout tip; eye $4\frac{1}{2}$, 1-4/5 in snout, $1\frac{1}{4}$ to $1\frac{1}{2}$ in interorbital; maxillary apparently not quite reaching eye, length 3 in head from snout tip; interorbital slightly convex.

Scales 48 ro 53 in lateral series; 9 transversely.

D. 13 to 15, first branched ray 2 in total head length; A. I, 16 or I, 17, first branched ray 2-1/8; caudal 1-1/3, moderately forked, lower lobe longer; least depth of caudal peduncle 4; pectoral $1\frac{3}{4}$; ventral $2\frac{1}{2}$.

In life bright green above, head darkest, pale green below. Sides with broad well-defined silvery band. Length 380 mm. (Ogilby.)

North Australia, Queensland, New South Wales. Although originally credited to New Zealand, the type locality appears to be erroneous.

Arrhamphus brevis (Seale)

Oxyporhamphus brevis SEALE? Philippine Journ. Sci., vol. 4, p. 495, pl. 2, 1910 (type locality: Paawacan, Palawan Island, Philippines).

Arrhamphus brevis WEBER and BEAUFORT, Fishes Indo-Austral. Archipel., vol. 4, p. 172, fig. 59, 1922 (no locality).

Depth 6¼ to 7-2/3, moderately compressed, sides more or less flattened; head 3-7/8 to 4-2/5, width 2-1/3 to 2¾. Snout 2-7/8 to 3 in head from snout tip; eye 3¾ to 4, 1¼ to 1-1/3 in snout, 1 to 1-1/6 in interorbital; maxillary reaches 2/3 to ¾ to eye, length 4 to 4-1/8 in head from snout tip; mandible but very slightly protruded before snout tip; interorbital 3½ to 3-4/5 in head from snout tip, low, level. Gill rakers 8 17, lanceolate, 2-1/3 in gill filaments, which 1-7/8 in eye.

Scales 52 to 54 in axial lateral series from above gill opening to caudal base and 4 more on latter; 7 above lateral line to dorsal origin, 3 below to anal origin; 46 to 48 predorsal to front of snout of which 36 or 37 extend to occiput. Vertical fins finely scaled. Scales with 0 to 5 basal radiating striae; circuli fine, usually less distinct or absent apically.

D. II, 13, I or II, 14, I, first branched ray 1-5/6 to 2-1/5 in total head; A. II, 13, I, first branched ray 2-2/5 to 3; caudal 1 to 1-1/8, deeply forked, lower lobe little longer; least depth of caudal peduncle 3-2/3 to 4½; pector 1 1½ to 1¾; ventral 2¼ to 2¾, origin midway between front or hind pupil edge and caudal base.

Back brown, below and under surfaces paler with silvery reflections. Sides of head more or less bright silvery white, also iris. Snout above brown, like top of head. Narrow silvery white lateral streak from above pectoral origin, expanded until about half vertical pupil diameter between dorsal and anal, bordered with neutral gray line above. Fins pale brown, anal and caudal still paler or even with pale yellowish tinge basally. Caudal lobes variably with black tips, usually lower more extensive. Front dorsal and anal lobes, one or other or both, sometimes tipped with black.

Philippines, East Indies.

6385 to 6388. Mantaquin Bay, Palawan. April 1, 1909. Length 143 to 233 mm.

6203 to 6208. Mantaquin Bay, Palawan. April 2, 1909. Length 165 to 247 mm.

20614 to 20617. Sirinao Island, Nakoda Bay near Alphonso XIII. December 30, 1908. Length 154 to 187 mm.

7821 to 7823. Ulugan Bay near Baheli River mouth. December 28, 1908. Length 198 to 230 mm.

5083. Sandakan Bay, Borneo. March 1, 1908. Length 205 mm.

Genus Dermogenys Van Hasselt.

Dermogenys VAN HASSELT, Algem. Konst-en Letterbode, vol. 1, p. 131, 1823 (type Dermogenys pusillus VAN HASSELT, monotypic).

Dermatogenys PETERS, Monatsb. Akad. Wiss. Berlin, 1865, p. 163 (type Dermogenys pusillus VAN HASSELT).

Rhamphodermogenys FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, p. 15, 1922 (type Dermogenys bakeri Fowler and Bean, orthotypic).

Body elongate, rather compressed. Head rather large. Premaxillaries form tapering plate, truncate in front. Mandible extended as beak, without teeth except space opposite premaxillaries. Beak bordered each side by fold of skin, projects horizontally and not always visible in preserved specimens. Small pointed teeth in both jaws. Gill rakers short. Third upper pharyngeals ankylosed. Scales moderate, rather deciduous. Lateral line low, indistinct. Dorsal shorter than anal, begins behind anal origin. Anal without enlarged rays, though male sometimes front part of anal enveloped by swollen fold of skin, apparently outgrowth of genital papilla. Caudal rounded. Pectoral high, rather far behind gill opening. Ventral small, premedian, median, or postmedian.

Small, fresh water half beaks, distributed in India, Siam, Malaya, East Indies, and Philippines.

The following doubtful:

Dermogenys brachynotopterus (Bleeker).

Hemiramphus brachynotopterus BLEEKER, Verh. Batav. Gennotsch. (Nal. Ich. Bengal), vol. 25, p. 29 (73) 146, 1853 (type locality: Calcutta).

Hamiramphus brachijnotopterus BLEEKER, Verh. Batav. Genootsch. (Nal. Ich. Bengal), vol. 25, p. 146, 1853 (Hooghly River, Calcutta, India).

Hemirhamphus brachynotopterus GÜNTHER, Cat. Fish. Brit. Mus., vol. 6, p. 275, 1866 (copied)1 -- DAY, Fishes of India, pt. 3, p. 517, 1877 (copied); Fauna British India, Fishes, vol. 1, p. 428, 1889 (copied).

Depth 12, body elongated, compressed, little higher than wide; head 3 1/4. Snout 4 2/3 in length of body; eye 2 in postorbital, rather over 1 in interorbital; upper jaw rather wider than long, not long as eye; upper surface of head flat.

D. 9, first ray inserted over fifth anal ray; A. 15, base not twice that of dorsal, fin not lower than body, lower edge concave; caudal rounded. (Day.)

India. Differs from all the known species of the genus in its short premaxillary so that triangular upper jaw wider than long.

Analysis of Species

a^1. Pectoral short, not nearly reaching ventral.

b^1. Ventral origin nearer caudal than eye; anal rays 14. pusillus.

b^2. Ventral origin midway between head and caudal base; anal rays 15. sumatranus.

b^3. Ventral origin little nearer head than caudal base.

c^1. Length of lower jaw beyond end of upper jaw 5 2/5 to 6 1/10 in length to caudal base; dorsal rays 9 or 10.

d^1. Anal rays 15 or 16; scales 45 to 47. orientalis.

d^2. Anal rays 17 ro 19; scales 50. weberi.

c^2. Length of lower jaw beyond end of upper jaw 7 4/5 to 8 2/5 in length to caudal base; dorsal rays 10 to 12; scales 54. ebrardtii.

a^2. Pectoral reaching ventral, large. pectoralis.

Dermogenys pusillus Kuhl and Van Hasselt

Dermogenys pusillus KUHL and VAN HASSELT, Konst.- en Letterbode, vol. 1, p. 131, 1823 (type locality: Batavia); Bull. Sci. Nat. Geol. Férussac, vol. 2, p. 374, 1824 (Buitenzorg). -- BLEEKER, Atlas Ichth. Ind. Néerland., vol. 6, p. 64, pl. ( ) 253, fig. 2, 1866-72 (Java, Sumatra). -- BEAN and WEED, Proc. U. S. Nat. Mus., vol. 42, p. 595, figs. 1-2 (anal fin), 1912 (Buitenzorg). -- WEBER and BEAUFORT, Fishes Indo-Austral. Archipel., vol. 4, p. 140, 1922 (Buitenzorg, Tjipanas, Situ Bagendit, Semarang, Java; Upper Riko River, Borneo). -- FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, p. 14, 1922 (Zamboanga).

Hemirhamphus viviparus PETERS, Monatsb. Akad. Wiss. Berlin, 1865, p. 132 (type locality: Rio Basey, Samar).

Hemirhamphus (Dermatogenys) viviparus PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 273 (Rio Yasot, Luzon).

Hemirhamphus viviparus BLEEKER, Atlas Ichth. Ind. Néerland., vol. 6, p. 65, 1866-72 (copied). -- ELERA, Cat. Fauna Filip., vol. 1, p. 573, 1895 (Samar).

Dermatogenys viviparus FOWLER, Copeia, no. 58, p. 62, June 18, 1918, (Philippines); Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 10 (Philippines).

Hemiramphus fluviatilis BLEEKER, Nat. Tijds. Nederland. Indië, vol. 1, p. 95, 1850 (1851) (type locality; Batavia; Tandjong Oost; Buitenzorg; Tjampea); Verh. Batav. Genootsch. (Snoek. Vissch.), vol. 24, p. 16, 1852 (same localities); Nat. Tijds. Nederland. Indië, vol. 7, p. 314, 1854 (Perdana); vol. 9, p. 393, 1855 (Lake at Grati, Java); vol. 13, p. 476, 1857 (Buitenzorg), p. 477 (Tijipamas; Tjiandjoer); vol. 16, p. 48, 1858 (Buitenzorg); Act. Soc. Sci. Ind. Neerland., vol. 5, no. 6, p. 4, 1858-59 (Palembang, Sumatra); vol. 8 (Acht. Sumat.), p. 55, 1859 (Palembang). -- WEBER, Zool. Ergebn. Reise Nederland. Oost Indië, vol. 3, p. 456, 1894 (Sumatra; Java). -- REICHELT, Natur Haus, Dresden, vol. 14, p. 118, 1904 (Malacca).

Hemirhamphus fluviatilis GUNTHER, Cat. Fish. Brit. Mus., vol. 6, p. 275, 1866 (Java). -- KAROLI, Termesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (Siam, Santabug, Palaban, Sandanglajia, Megamendok). -- ELERA, Cat. Fauna Filipinas, vol. 1, p. 576, 1895 (Samar, Borongan). -- DÜNCKER, Mitt. Naturhist. Mus. Hamburg, vol. 21, p. 147, text fig. (anal rays), 1903 (1904) (Klang and Kuala Langat; Singapore). -- VOLZ, Nat. Tijds. Nederland. Indië, vol. 66, p. 180, 1907 (Palembang).

Hemirhamphus (Dermatogenys) fluviatilis PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 272 (Nusa Kimbangan, Java).

Dermogenys bakeri FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, p. 15, fig. 3, 1922 (type locality; Zamboanga).

-- FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 263 (Calapan, Philippines).

Depth 6-1/5 to $7\frac{3}{4}$; head 2-1/3 to 2-3/5, from upper jaw tip 3-1/6 to 3-2/5, width 3 to 3-2/5. Snout 2 to $2\frac{1}{4}$ in head measured from upper jaw tip; eye 4-1/5 to $4\frac{3}{4}$, 1-7/8 to 3 in snout, 1 to $1\frac{1}{2}$ in interorbital; maxillary reaches eye, length 2 to $2\frac{1}{4}$ in head from snout tip; interorbital 3-2/5 to 4-1/5, low, depressed concavely. Gill rakers 2 17, short weak points, $\frac{1}{4}$ of gill filaments, which 1/3 of eye.

Scales 36 to 39 in axial lateral series to caudal base and 5 or 6 more on latter; 4 or 5 scales above axial lateral row, 5 to 7 below, 32 or 33 to 37 predorsal forward to occiput. Scales with 5 to 12 basal radiating striae; circuli complete, 18 to 20. Lateral line incomplete, low, not extended beyond ventral base in small examples, in adults not quite reaching anal.

D. II, 8 to III, 7, first branched ray 3-1/5 to $4\frac{1}{4}$ in total head length; A. II, 13, second ray 3-1/3? to 4; caudal 2-1/3 to 2-2/3, rounded behind; least depth of caudal peduncle $5\frac{1}{2}$ to 6; pectoral $2\frac{1}{4}$ to 2-3/5; ventral 4 to 4-1/3, origin slightly nearer caudal base than hind eye edge.

Dull to pale brown, sides and lower surface paler with whitish or silvery tints. Back above with close set dark brown dots, arranged on predorsal as 3 parallel close-set lines, median less distinct. Blackish spot, well contrasted, behind upper end of gill opening before pectoral origin. Iris grayish. Narrow dark gray axial line, most distinct between dorsal and anal. Fins all pale, dorsal caudal and pectoral tinted pale brown, front of dorsal sometimes black.

Malaya, East Indies, Philippines. Examination of the type of Dermatogenys bakeri shows it to be a variant of the present species, in which the upper jaw somewhat longer than usual.

1 example. Caiholo River, Ulugan Bay, Palawan. December 29, 1908. Length 43 mm.

1 example. Iwahig River and tributary, Palawan. April 4, 1909. Length 65 mm.

1 example. Malampaya River, Palawan. December 26, 1908. Length 40? mm.

27 examples. Mariquina River, at Uaua. January 1, 1908. Length 22 to 73 mm.

17 examples. Nakoda Bay, Palawan. December 31, 1908. Length 31 to 60 mm.

3 examples. Nato River, Lagonoy Gulf, Luzon, June 18, 1909. Length 65 to 114 mm.

1 example. Pancol, Malampaya Island. December 25, 1908. Length 46 mm.

69 examples. Pangauron River, Port Caltom. December 16, 1908. Length 30 to 81 mm.

8 examples. Stream near village at Chase Head, Endeavour Strait, Palawan, December 22, 1908. Length 45 to 63 mm.

1 example. Ulugan Bay, Palawan. From among arms of Comanthina nobilis. Length 36 mm.

2 examples. [1680.] Zamboanga Canal. October 8, 1909. Length 38 to 44 mm.

1 example. Zamboanga. October 9, 1909. Length 53 mm.

U. S. N. M., no. 72568. Java. O. Bryant and Wm. Palmer. Length 32 mm.

U. S. N. M., no. 72569. Java. O. Bryant and Wm. Palmer. Length 35 mm.

U. S. N. M., no. 72570. Buitenzorg, Java. April 3, 1909. O. Bryant and Wm. Palmer. Length 33 to 47 mm. 4 examples.

U. S. N. M., no. 72571. Buitenzorg, Java. April 3, 1909. O. Bryant and Wm. Palmer. Length 30 to 36 mm. 4 examples.

U. S. N. M., no. 72572. Buitenzorg, Java. March 10, 1909. O. Bryant and W. Palmer. Length 37 to 46 mm. 9 examples.

U. S. N. M., no. 84273. Zamboanga. Dr. F. Baker. Length 45 mm.

U. S. N. M., no. 84 275. Zamboanga. Dr. F. Baker. Length 43 mm. Type of Dermatogenys bakeri.

Dermogenys sumatranus (Bleeker)

Hemiramphus sumatranus BLEEKER, Nat. Tijds. Nederland. Indië, vol. 5, p. 526, 1853 (type locality: Lake Maniniju, Sumatra); Act. Soc. Sci. Ind. Néerland. (Acht. Sumat.), vol. 8, p. 55, 1859 (Meninju Lake). -- KÁROLI, Termesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (Change). -- WEBER, Zool. Ergebn. Reise Nederland. Oost. Indië, vol. 3, pp. 427, 456, 1894 (Sumatra). -- ELERA, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Luzon, Rio Lonaten, Morong).

Hemirhamphus sumatranus GÜNTHER, Cat. Fish. Brit. Mus., vol. 6, 275, 1866 (type). -- VOLZ, Nat. Tijds. Nederland. Indië, vol. 66, p. 180, 1907 OPalembang).

Dermogenys sumatranus BLEEKER, Nederland. Tijdschr. Dierk., vol. 3, p. 167, 1866 ( ); Atlas Ichth. Ind. Néerland., vol. 6, p. 65, pl. (7) , fig. 1 (Lake Meninju, Sumatra). -- WEBER and BEAUFORT, Fishes Indo-Austral. Archipel., vol. 4, p. 139, 1922 (Fort de Kock, Andalas, Bagan Api Api, Sumatra; Balikpapan, Borneo).

Depth 8-2/3; head $2\frac{3}{4}$. Snout $2\frac{1}{2}$ in head from snout tip; eye $3\frac{1}{2}$, $1\frac{1}{2}$ in snout, 1 in interorbital; maxillary apparently nearly reaches eye, nearly long as snout; mandible before snout 1-7/8 in rest of head; teeth conic, simple; interorbital very low.

Scales 45 in lateral series (about 38 on figure and 5 shown above lateral line to dorsal origin).

D. II, 8 (I, 8 on figure), fin height 5-4/5 in total head length; A. II, 14 (I, 11 on figure), fin height 3-3/5; caudal $2\frac{1}{2}$, convex behind; least depth of caudal peduncle $6\frac{3}{4}$; pectoral 2-1/5, rays I, 9; ventral $4\frac{1}{2}$ in total head length, rays I, 5, reaches $1\frac{1}{4}$ to anal.

Brownish green. No silvery lateral band. Dorsal, pectoral and ventral yellowish. Caudal brown. Anal yellowish. Length 75 mm.

(Bleeker.)

East Indies, Philippines. Bleeker says it resembles Dermogenys brachynotopterus Bleeker, but that species differs in its short premaxillary broader than long, while in the present species longer than broad.

Dermogenys orientalis (Weber)

Hemiramphus orientalis WEBER, Zool. Ergebn. Reise Nederland. Oost Indië,, vol. 3, p. 427 (456), 1894 (type locality: Luw, Celebes.)

Hemirhamphus orientalis BOULENGER, Proc. Zool. Soc. London, 1897, p. 429 (Kalaena River, Toka River near Paloppo, stream between Eurekang and Batulappa, Central Celebes; Macassar, south Celebes).

Dermogenys orientalis WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 137, fig. 52, 1922 (Meridan River, Borneo; Moros, Tempe, Luwu, Celebes).

Depth 6-4/5 to 7-4/5, body somewhat compressed; head from upper jaw tip 2½ to 2-4/5 in trunk. Triangular part of upper jaw truncate in front, larger than wide; eye 1-1/3 to 2 in porstorbital, less than interorbital; length of lower jaw beyond end of upper somewhat more than 6 in length without caudal; teeth small, pointed; preorbital rounded, about ½ of eye.

Scales 45 to 47 in-lateral series.

D. 9 or 10, origin above fifth or sixth anal ray, fin higher than anal; A. 15 or 16, rounded like dorsal; caudal rounded; P. I, 9, inserted rather far behind gill opening, as long as space between mouth corner and gill opening or little larger; V. I, 5, about half long as pectoral, base little nearer head than caudal.

Yellowish, with fine dark lateral line on body, accompanied on posterior part of body by faint indication of silvery lateral band. Length 78 mm. (Weber and Beaufort.)

East Indies.

8 examples. Chase Head in stream near village, Endeavour Strait, Palawan. December 22, 1908. Length 43 to 65 mm. One example. Iwahig River tributary, Palawan. April 4, 1909. Length 60 mm.

One example. Malampaya River, Palawan. December 26, 1908. Length 45? mm.

31 examples. Mariquina River at Uaua. January 1, 1908. Length 18 to 70 mm.

18 examples. Nakoda Bay, Palawan. December 31, 1908. Length 31 to 60 mm.

One example. Pancol, creek at head of tide water, Malampaya Island. December 25, 1908.

69 examples. Pangauron River, Port Caltom. December 16, 1908. Length 30 to 79 mm.

One example. Ulugan Bay, Palawan. From among arms of large specimen of Comanthina nobilis. Length 37? mm.

One example. Zamboanga canal. October 8, 1909. Length 42 mm.

One example. Zamboanga River. October 9, 1909. Length 51 mm.

Dermogenys weberi (Boulenger)

Hemirhamphus weberi BOULENGER, Proc. Zool. Soc. London, 1897, p. 429, pl. 28, fig. 4 (type locality: Lake Matanna, southeast Celebes).

Hemiramphus weberi WEBER, Bijdr. Dierk. Amsterdam, of. 19, p. 202, 1914 (Soroako at Matano Lake, southeast Celebes).

Dermogenys weberi WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 138, 1922 (Lake Matanna, Celebes).

Depth 8; head 2-1/3. Snout 2-2/3 in head from snout tip; eye 4½, 1-3/4 in snout, 1 in interorbital; fremaxillary apparently reaches eye or long as snout, upper jaw width less than its length; interorbital low, flat.

Scales 50 in medial latheral series (about 56 on figure; 9 above anal base to dorsal origin).

D. 9, fin height 3½ in total head length; A. 19, fin height 3-7/8; caudal 3¼, rounded (slightly emargnate on figure); least depth of caudal peduncle about equals eye; pectoral 2-4/5 in total head length ; ventral 4-4/5, reaches 1-1/3 to anal.

Blackish above, silvery on sides and below. Fins white. Pectoral black at base. Ventral black at tip. Length 90 mm. (Boulenger.)

Celebes. According to Weber and Beaufort. D. 9 or 10, A. 17 to 19; lateral line about 50.

Dermogenys ebrardtii (Popta)

Hemiramphus (Dermatogenus) ebrardtii POPTA, Notes Leyden Mus., vol. 24, pts. 3-4, p. 187, 1912 (type locatity: Kabaena, Penango and Rumbia. Ebene, southeast Celebes).

Depth 5 to 5½ in length without projecting part of lower jaw, body compressed; head to upper jaw tip 2-1/5 to 2-5/8 in trunk. Triangular part of snout longer than wide; eye nearly 2 in postocular, 1-1/5 to 1½ in interorbital; length of lower jaw before end of upper jaw 7-3/5 to 8-2/5 in length of body to caudal base; teeth small, pointed.

Scales 54 in lateral series.

D. 10 to 12, origin above fourth anal ray, fifth ray longest or somewhat less than second and longest anal ray; A. 15, caudal rounded; P. 12, 6¼ to 7 in length with caudal, twice long as ventral; V. 6, base little nearer head than caudal.

Yellowish in alcohol. Dark blotch at pectoral base. Length about 90 mm. (Weber and Beaufort.)

Celebes.

Dermogenys pectoralis new species.

Depth 5½ to 5-3/5; head 2-2/5 to 2½, from upper jaw tip 3 to 3-1/5, width 2-7/8 to 3-1/10. Snout tip to eye 2¼ to 2-2/5 in head from snout tip; eye 3½ to 4 in head, 1-2/3 to 1-3/4 in snout, 1 to 1-1/8 in interorbital; maxillary reaches opposite front eye edge, length 2¼ to 2-2/5 in head from snout tip; interorbital 2-7/8 to 3½, low, slightly concave. Gill rakers 1 + 9 low points, ¼ of gill filaments, which 2 in eye.

Scales 40 or 41 in axial lateral series to caudal base and 5 more on latter; 16 transversely from front of anal sheath to dorsal origin, 36 or 37 predorsal forward to occiput. Scales small and more or less crowded about edges of body and on caudal. Scales with 5 or 6 basal radiating striae; circuli 18 to 20, complete.

D. II, 8, first brached ray 3 to 3-1/8 in total head length; A. III - 8, third branched ray 4 to 4-1/5; caudal 2-1/5 to 2-1/3, rounded behind; least depth of caudal peduncle 4-3/4 to 4-4/5; pectoral 1-3/4 to 1-4/5, reaches to or slightly beyond ventral origin; ventral 3-2/3 to 3-3/4.

Largely uniform brownish. Iris pale, evidently silvery when fresh. Fins all brownish, hind caudal portion with narrow submarginal blackish line.

Diagnosis. Unique in the large pectoral, which extends far back as ventral. Upper jaw also nearly to quite half length of beak as measured to the eye. Front simple rays of anal firm, set off and forward with basal scaly sheath, all much shorter than lobe of branched rays. Lateral line low and rather indistinct after ventrals.

U.S.N.M., No. . Bubucan. December 19, 1907. Largest example 46 mm, type and 3 others, 20 to 42 mm, paratypes. In smallest example beak quite shortened so lower jaw but little more an eye diameter, also its pectoral not quite reaching anal.

Genus Euleptorhamphus Gill

Euleptorhamphus GILL, Proc. Acad. Nat. Sci. Philadelphia, 1859, p. 156. (Type Euleptorhamphus brevoorti GILL = Hemiramphus viridis VAN HASSELT, monotypic.)

Body elongate, very slender, compressed, more or less band like. Head compressed, sloping below so its lower edge quite narrow or even keel like. Snout short, but little longer than wide. Eye nearly circular, advanced, high. Mandible greatly prolonged as slender beak. Teeth minute, in bands in jaws. Nasal cavity large, close before eye, flap large. Interorbital flat, like most of upper surface of head. Gill rakers lanceolate, numerous. Scales narrowly exposed, loose. Lateral line low. Dorsal moderate, posterior. Anal like dorsal, similar. Caudal well forked, lower lobe longer. Pectoral very long, falcate, reaches half way or more to ventral. Ventral small, inserted little nearer caudal base than pectoral origin.

Apparently a single widely distributed species in most tropical or subtropical seas.

Euleptorhamphus viridis (Van Hasselt).

Hemiramphus viridis VAN HASSELT, Bull. Sci. Nat. Géol., Férussac, vol. 2, p. 374, 1824 (on Kuddera C. RUSSELL, Fishes of Coromandel, vol. 2, p. 62, pl. 178, 1803, type locality: Vizagapatam).

Hemi - Ramphus longirostris CUVIER, Règne Animal, ed. 2, vol. 2, p. 286, 1829 (on Kuddera C. RUSSELL).

Hemiramphus longirostris VALENCIENNES, Règne Animal, Ill., Poiss., pl. 98, fig. 2, 1839; Hist. Nat. Poiss., vol. 19, p. 52, 1846 (Pondicherry). --BLEEKER, Verh. Batav. Genoots. (Beng. Hind.), vol. 25, p. 8, 1853.

Hemirhamphus longirostris GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 276, 1866 (Copied).

--DAY, Fishes of India, pt. 3, p. 513, 1877.

--JORDAN and GILBERT, Bull. U. S. Nat. Mus., no. 16, p. 377, 1882 (compiles). --DAY, Fauna Brit. India, Fishes, vol. 1, p. 423, 1889.

--GÜNTHER, Journ. Mus. Godeffrwy, vol. 8, pt. 16, p. 358, 1909 (Hawaii; open sea).

Euleptorhamphus longirostris PUTNAM, Proc. Boston Soc. Nat. Hist., vol. 13, 1870, p. 239 (Kawaihee, Hawaii; Nantucket, Massachusetts). --JENKINS, Bull. U. S. Fish. Comm., vol. 22, p. 434, 1902 (1903) (Honolulu). --SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904) (Honolulu). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, p. 128, fig. 43, 1903 (1905) (Honolulu). --JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, p. 176, 1909 (on Jordan and Evermann). --JORDAN, TANAKA, SNYDER, Journ. Coll. Sci. Tokyo, vol. 33, art. 1, p. 109, 1913 (compiled). --IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 166, 1920 (Inatori, Izu). --BARNARD, Ann. South Afr. Mus., vol. 21, pt. 1, p. 264, June 1925 (Walfish Bay). --MC CULLOCH, Fishes of New South Wales, p. 31, pl. 10, fig. 109a, 1927. --FOWLER, Men. Bishop Mus., vol. 10, p. 74, 1928 (Hawaiian Islands; Honolulu).

Euleptoramphus longirostris JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 329, 1902 (Formosa).

Hemiramphus macrorhyncus VALENCIENNES, Hist. Nat. Mus., vol. 19, p. 55, 1846 (type locality: open sea, lat. 7° S., long. 177° W.; Pepster Island, Polynesia).

Hemiramphus macrorhynchos VALENCIENNES, Hist. Nat. Poiss., vol. 19, pl. 556, 1846.

Hemirhamphus macrorhynchus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 276, 1866 (copied).

--COPE, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 121 (Atlantic City, N. J.).

Hemiramphus (Euleptorhamphus) macrorhynchus STEINDACHNER, Denks. Akad. Wiss. Wien, vol. 70, p. 511, 1901 (South Sea).

Euleptorhamphus macrorhynchus PUTNAM, Proc. Boston Soc. Nat. Hist., vol. 13, p. 239, 1870 (Cayenne, Guiana; unknown locality). --SEALE, Occas. Pap. Bishop Mus., vol. 1, no. 5, p. 19, 1902 (Honolulu).

Euleptorhamphus brevoorti GILL, Proc. Acad. Nat. Sci. Philadelphia, 1859, p. 56 (type locality: not given).

Euleptorhamphus brevoortii FOWLER, Proc. Biol. Soc. Wash., vol. 33, p. 155, Dec. 30, 1920 (Atlantic City record); Proc. Acad. Nat. Sci. Philadelphia, 1920, p. 386 (March 4, 1921) (Cape May, N. J.)

Euleptorhamphus velox POEY, Synop. Cuba, 383, 1867 (type locality: Cuba). --PUTNAM, Proc. Boston Soc. Nat. Hist., vol. 13, p. 240, 1870 (reference). --FOWLER, Rep. New Jersey State Mus., p. 209, 1905 (1906) (Cope's example); p. 288, fl. 94, 1906 (1907)

Hemirhamphus elongatus TANAKA, Fig. Descr. Fishes of Japan, vol. 2, p. 22, pl. 6, fig. 2, June 15, 1911 (type locality: Misaki, Sagami).

Depth 16-3/5, well compressed, flattened sides little convergent below; head 3, head from snout tip 7, width 3-1/8. Snout 3 in head from snout tip; eye 3-3/5, 1-1/5 in snout, slightly greater than interorbital; maxillary reaches 3/4 to eye, length 3-7/8 in head from snout tip; interorbital 3-3/4, flat. Gill rakers 8 + 25, lanceolate, slender, ½ of gill filaments which 2-2/5 in eye.

Scales (pockets) 106? in axial lateral series from gill opening to caudal base; 6 above, 2 below, 60? predorsal forward to occiput. Dorsal and anal scaleless, caudal base with small scales (pockets). Scales without basal striae; circuli as fine parallel vertical striae, 75 or 76 basal, 23 to 25 apical, rarely continuous in median vertical axis.

D. II, 20, fin height 4-4/5 in head from mandible tip; A. II, 20, first branched ray 4½; caudal (damaged) forked; least depth of caudal peduncle 15-3/4?; pectoral 1-7/8?; ventral 9½?

Black and upper surface pale brown, sides and below more or less bright silvery white. Iris silvery white. Beak pale. Fins all very pale or light brownish.

South Africa, India, Formosa, Japan, Polynesia, Hawaii. Also in the Atlantic from New Jersey and Massachusetts.

The usually accepted name for this species, from Hemi-Ramphus longirostris Cuvier 1829, gives place to the earlier Hemiramphus viridis Van Hasselt 1824.

A. N. S. P., no. 22443. Atlantic City, N. J. Edward S. Keed. Length 394 mm.

A. N. S. P., one example. Honolulu, Hawaiian Islands. J. W. Thompson. Bishop Museum. Length 380 mm.

A. N. S. P., two examples. Honolulu. J. W. Thompson. Bishop Museum (45) Length 376 to 433 mm.

Genus Hemirhamphodon Bleeker

Hemirhamphodon BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 140, 1866. (Type Hemirhamphus phaiosoma BLEEKER, orthotypic.)

Body elongate, compressed. Head long. Triangular upper jaw longer than wide. Eye large. Mandible extended into beak, which furnished with small pointed teeth; with lateral horizontal fold of skin on each side, especially developed in part opposite upper jaw and not always conspicuous in preserved specimens. Gill opening wide. Gill rakers short. Scales very small. Dorsal posterior, well in advance of anal and much longer. Caudal rounded. Pectorals placed rather low, moderate. Ventrals variably shorter or longer than pectoral, before or behind dorsal origin.

Fishes living in brackish waters, in Malaya and East Indies.

Analysis of Species

a^1. D. 15 to 17; ventral origin before dorsal origin.----------pogonognathus.

a^2. D. 21 to 23; ventral origin behind dorsal origin.----------phaiosoma.

Hemiramphodon pogonognathus (Bleeker)

Hemiramphus pogonognathus BLEEKER, Nat. Tijds. Nederland Indië, vol. 5, p. (176) 193, 1853 (type locality: Marawang, Banka); vol. 13, p. 284, 1857 (Tjirutjap, Biliton). --WEBER, Zool Ergebn. Reise Nederland Ost Indië, vol. 3, p. 456, 1894 (Banka; Billiton). --VOLZ, Zool. Jahrb. Syst., vol. 19, p. 394, 1903. (Sumatra); Rev. Suisse, Zool, vol. 12, p. 472, 1904 (Sumatra).

Hemirhamphus pogonognathus GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 273, 1866 (type). --KÁROLI, Termesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (Sarawak). --DUNCKER, Mitteil. Nat. Mus. Hamburg, vol. 21, p. 170, 1903 (1904) (Kuala Lumpur, Kual Jelai, Muar River). --VOLZ, Nat. Tijds. Nederland Indië, vol. 66, p. 179, 1907 (Palembang).

Hemirhamphodon pogonognathus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 169, 1866 (Banka; Biliton); Atlas Ichth. Ind. Néerland, vol. 6, p. 66, pl. ( ) 254, fig. 1, 1866-72 (Banka; Billiton). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 144, fig. 54, 1922 (Taluk, Gunwng Sahilan, Sumatra).

Hemirhamphodon kukenthali STEINDACHNER, Abh. Senckenberg. Ges. Frankfurt, vol. 25, p. 450, pl. 17, fig. 2, 1900 (1901) (type locality: Baram River, Borneo).

Depth 10 to 10-2/5; head 2¼. Snout 2¼ in head from snout tip; eye 2¼, 1-4/5 in snout, 1 in interorbital; maxillary apparently nearly reaching eye; lower jaw extends beyond end of upper jaw 1-4/5 in rest of head; interorbital very low.

Scales 94 to 100 in lateral series.

D. 15 to 17, fin height 6-3/5 in total head length; A. 6 or 7, fin height 3-7/8; caudal 2-2/3, rounded; least depth of caudal peduncle subequal with eye; pectoral rays I, 7 or I, 8, fin 4 in total head; ventral 3-3/4, ray I, 5, fin reaches 1-1/5 to anal.

Dark brown above, lighter below. Dark patch on opercle. Fins more or less dark, dorsal with dark border. Length 189 mm.

(Weber and Beaufort).

Malaya, East Indies.

Hemirhamphodon phaiosoma (Bleeker)

Hemiramphus phaiosoma BLEEKER, Naturk. Tijds. Nederland Indië, vol. 3, p. (88, 89) 99, 1852 (type locality: Tjirutjup River, Blitong, Billiton); Verh. Batav. Genoot. (Snoek. Vissch.), vol. 24, p. 26, 1852 (Blitong, Billiton Island and Tjirutjup River).

Hemirhamphus phaiosoma GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 272, 1866 (type). --KÁROLI, Termez. Füzetek, Budapest, Vol. 5, p. 182, 1881 (Sarangoon, Palandok, Sadong, Matang).

Hemiramphus phaeosoma WEBER, Zool. Ergebn. Reise Nederland Ost Indië, vol. 3, p. 456, 1894 (Banka; Billiton).

Hemirhamphodon phaiosoma BLEEKER, Néderland Tijdschr. Dierk., vol. 3, p. 168, 1866 (Biliton; Banka); Atlas Ichth. Ind. Neerland, vol. 6, p. 66, pl. (8) 254, fig. 2, 1866-72 (Billiton; Banka). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 143, 1922 (Bleeker's material).

Depth 9-3/4; head 2-2/5. Snout 2-1/8 in head from snout tip; eye 4½, 2 in snout, equals interorbital; maxillary reaches 4/5 to eye, length 2½ in head from snout tip; teeth conic, pointed; interorbital low.

Scales 70 in lateral series.

D. I, 20 to I, 22, fin height 3-3/4 in total head; A. I, 8 (I, 7 on figure), fin height 4; caudal 2-3/4, convex behind; least depth of caudal peduncle 1¼ times eye; pectoral 3-1/6 in total head, rays I, 7 or I, 8; ventral I, 5, origin below first third of dorsal base, fin 6-1/8 in total head, reaches 1-2/3 to anal.

Brownish green, below paler. No silvery lateral band. Fins brownish. Length 77 mm. (Bleeker.)

Malaya, East Indies. Weber and Beaufort give the scales as 90 in lateral series.

Genus Loligorhamphus Whitley

Loligorhamphus WHITLEY, Rec. Australian, Mus., vol. 18, no. 3, p. 105, March 25, 1931. (Type Loligorhamphus normani WHITLEY, orthotypic.)

Body slender, elongate. Head compressed, flat above. Snout little longer than broad. Eye large, midway in head from snout tip. Maxillary not entirely concealed. Beak long, tapering, with narrow median grove and each lateral cutaneous fold broader than beak itself. Interorbital low. Gill rakers, slender, numerous. Scales small. Anal begins little behind dorsal origin. Caudal forked, lower lobe little longer. Pectoral small, pointed. Ventral small, short, inserted nearer caudal base than pectoral base.

Known among all the genera of the family by the greatly developed cutaneous flap along each side of the mandible or beak.

Loligorhamphus normani Whitley

Loligorhamphus normani WHITLEY, Rec. Australian Mus., vol. 18, no. 3, p. 105, pl. 12, figs. 2-3, March 25, 1931 (type locality: Townsville, Queensland).

Depth 14, compressed, flattened on dorsal and ventral surfaces; head 2, head from snout tip 4, width 3. Snout 2-1/3 in head from snout tip; eye 4, 1-2/5 in snout, 1-1/8 in interorbital; maxillary apparently reaches 4/5 to eye, length about 2-3/4 in head from snout tip; interorbital 3-3/5, low or nearly level. Gill rakers + 40.

Scales about 60 in lateral series; 6 on side of caudal peduncle. Tubes of lateral line straight, with few short simple lateral branches. Fins without scales.

D. 14, first ray 7¼ in total head length; A. 15, base shorter than dorsal base, fin height 9; caudal 4, forked, upper lobe shown but little shorter than lower; least depth of caudal peduncle about equals eye; pectoral 6 in total head length; ventral 7-1/5.

Brownish above, lighter below. Beak and folds nearly all black, also edges of lowermost folds and areas on top of head and opercle. Each scale pocket on back with blackish mark. A blackish lateral stripe, probably silvery in life, from punctulated pectoral base to caudal base, broadest between dorsal and anal. Fins colorless, with blackish pigment over dorsal and anal. Length 206 mm. (Whitley).

Queensland.

Genus Nomorhamphus Weber and Beaufort

Normorhamphus WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 141, 1922

(Type Normorhamphus celebensis WEBER and BEAUFORT.)

Body elongate, compressed. Head rather large. Triangular part of upper jaw long as wide. Eye high, median in head length. Mandible slightly projects beyond upper jaw, with fleshy extension at tip (curved backwards in preserved specimens). Premaxillary teeth in band, fine, similar in lower jaw. Gill openings wide. Gill rakers few, tubercular, spinescent. Scales moderate, rather deciduous. Lateral line indistinct, low. Dorsal far posterior, behind anal origin. Anal longer than dorsal. Caudal rounded. Pectoral high, less than head. Ventral small, little nearer head than caudal.

Small viviparous hemiramphids of the fresh waters of Celebes.

Analysis of Species

a[1]. Scales 50 to 55; D. 11 or 12.----------

----------celebensis.

a[2]. Scales 64; D. 12 or 13.----------hageni.

Nomorhamphus celebensis Weber and Beaufort

Nomorhamphus celebensis WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 141, fig. 53, 1922 (type locality: Lake Posso; rivulet at Lappa Kanru, Celebes).

Depth 5½, rather compressed; head 3. Snout 2¼ in head from snout tip; eye 5, 2 in snout, 1-3/4 in interorbital; maxillary reaches eye, length 2-1/8 in head from snout tip; interorbital flat.

Scales 50 to 55 in lateral series.

D. 11 or 12, fin height 2-2/3 in total head length; A. 15, fin height 2¼ inserted little before dorsal origin; caudal 1-3/4, convex behind; least depth of caudal peduncle 4-3/4; pectoral 2; ventral 3-2/5, origin midway between hind eye edge and caudal base.

Yellowish, with fine dark longitudinal line. Dorsal with black blotch at base of its hind border. Also some dark patches along front border. Front and hind border of anal blackish, also upper, lower and hind border of caudal, which last also with indications of cross bands. Paired fins tipped with black. Length 84 mm.

(Weber and Beaufort.)

Celebes.

Nomorhamphus hageni (Popta)

Hemiramphus hageni POPTA, Notes Leyden Mus., vol. 34, p. 190, 1912 (type locality: Penango-Rumbia Ebene in south east Celebes).

Nomorhamphus hageni WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 142, 1922 (types).

Depth 4½ to 5 in length with caudal; body compressed, width 2 to 2-2/3 in depth; head 3-1/7 to 3-4/7. Eye 5½ to 6 in head, 1-4/5 to 2 in postorbital part of head, 1-2/3 in interorbital; triangular part of upper jaw 1¼ times long as broad; teeth small.

Scales 64 in lateral series; 24 transversely.

D. 12 or 13, origin above fourth anal ray; A. 15; ventral origin midway between hind edge of eye and caudal base.

Olive brown above, yellowish below. Black blotch on shoulder. Length 94 mm. (Weber and Beaufort.)

Celebes.

Genus Zenarchopterus Gill

Zenarchopterus GILL, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 273. (Type Hemiramphus dispar VALENCIENNES, orthotypic.)

Labidorhamphus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1905, p. 493. (Type Hemirhamphus amblyurus BLEEKER, orthotypic.)

Body elongate, more or less compressed. Lower jaw prolonged in long beak, with fine feeble conic teeth only opposite short upper jaw; beak bordered by 3 more or less conspicuous folds of skin, one median begins on chin and one on each edge. Gill rakers well developed. Scales of back overlap each other in two directions. Lateral line low. Dorsal far postmedian, begins little before anal, which shorter. Male often with some dorsal rays produced and some anal rays much enlarged, broadened and articulations increased, also many fine secondary rays occur. Caudal round or truncate, never forked. Pectoral inserted high. Ventral nearer caudal than head.

Rivers and estuaries of the Indo Pacific, species numerous. Viviparous.

Analysis of Species

a[1]. Zenarchopterus. Triangular part of upper jaw slightly broader than long or wide or wide as long.

b[1]. Triangular part of upper jaw wider than long.

c[1]. Fourth dorsal ray of male moderately prolonged, not expanded, not reaching hind end of fin; anal with third lobe (tenth ray expanded) longest.--------dispar.

c[2]. Dorsal rays uniformly low; male with single anal lobe, its front rays longest.----------buffonis.

b[2]. Triangular part of upper jaw long as wide.

d[1]. Dorsal rays all uniformly low.

e[1]. Anal rays 13 or 14; male with trilobate anal.

f[1]. No dark lateral blotches on body; male with front anal lobe longest.----------novae-guineae.

f^2. Two round black spots medially on each side of body; male with median anal lobe longest. ----------quadrimaculatus.

e^2. Anal rays 11 or 12; male with median anal lobe usually longest.

g^1. Dorsal rays 14, fin black.-- ----------atrodorsalis.

g^2. Dorsal rays 12 or 13, uniformly low, dark brown.--------- ----------pappenheimi.

g^3. Dorsal rays 10 or 11, fourth prolonged and expanded terminally, reaches beyond fin.----------dunckeri.

e^3. Anal rays 8 or 9; male with bilobate anal and front lobe trifle longer.---------beauforti.

d^2. Fourth dorsal ray prolonged well beyond other rays.

$\underline{h}^1$. Male with fourth dorsal ray moderately extended, scarcely thickened, not reaching hind edge of fin; anal with median lobe longer than hind lobe and front lobe greatly shortest.------

----------kneri.

$\underline{h}^2$. Male with fourth dorsal ray greatly prolonged and thickened, reaches to or beyond hind end of fin; anal lobes 3, subequal.-----

----------philippinus.

$\underline{d}^3$. Fifth dorsal ray prolonged to tip of last dorsal ray.---------basudensis.

$\underline{a}^2$. Labidorhamphus. Triangular part of upper jaw 1½ to 2 or more times longer than broad; anal rays 11 to 13.

$\underline{i}^1$. Dorsal rays uniform; male with sixth anal ray expanded and apparently longest. ----------

----------caudovittatus.

i^2. Male with second to fifth rays forming small or short lobe little longer than others; anal with fifth to seventh rays expanded and subequally longest.--------ectuntic.

Zenarchopterus dispar (Valenciennes)

Hemiramphus dispar VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 58, pl. 558, 1846 (type locality: Madagasscar; Labouane River, Java). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 6, p. (458) 498, 1854; vol. 8, p. 307, 1855 (Batoe); vol. 9, p. 259, 1855 (Sebogha); vol. 13, p. 284, 1857 (Tjirutjup, Biliton), p. 374 (Sangi); Act. Soc. Sci. Ind. Néerland, no. 7, vol. 2, p. 7, 1857 (Amboina); no. 4, vol. 3, p. 4, 1857-58 (Tanawanko); no. 9, p. 3 (Padang), p. 4 (Trussan); Nat. Tijds. Nederland Indië, vol. 15, p. 203, 1858 (Goram); Act. Soc. Sci. Ind. Néerland. (Acht. Sumat.), vol. 8, p. 12, 1859 (Benchlen); Nederland Tijds. Dierk., vol. 1, p. 345, 1863 (Madagascar). --GUICHENOT, Mém. Soc. Sci. Cherbourg, ser. 2, vol. 2, p. 147, 1866 (Madagascar). --MARTENS, Preuss. Exp. Ost-Asien, vol. 1, pp. 210, 401, 1876 (Bangkok). --WEBER, Zool. Ergebn. Reise. Nederland Ost Indie", vol. 3, p. 456, 1894 (Billiton, Sumatra, Java, Celebes, Ternate).

Hemirhamphus dispar KNER, Sitz$. Ber. Akad. Wiss. Wien, vol. 30, p. 537, 1860 (Java). --GILL, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 273 (name). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 274, 1866 (Ceylon; East Indies). --PLAYFAIR, Proc. Zool. Soc. London, 1867, p. 868 ( ). --PETERS, Monatsb. Akad. Wiss. Berlin, 1871, p. 32 (Licuare River). --DAY, Fishes of India, pt. 3, p. 517, pl. 119, fig. 5, 1877, --SAUVAGE, Bull. Soc. Philom. Paris, ser. 4, vol. 7, p. 151, 1882 (Mé Nam, Siam). --DAY, Fauna Brit. India, Fishes, vol. 1, p. 426, 1889. --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1895 (name). --ELERA, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Luzon, Manila, Navotas). --VOLZ, Rev. Suisse, Zool., vol. 12, p. 472, 1904 (Sumatra); Nat. Tijds. Nederl. Indië, vol. 46, p. 180, 1907 (Padang, Siboga, Trussan, Benkulen, Deli, Langkat).

Hemirrhamphus dispar GORGOZA, Anal. Soc Espan. Hist. Nat. Madrid, vol. 14, p. 73, 1885 (Museo Ultramarino).

Hemirhamphus (Zenarchopterus) dispar BEAUFORT, Bijd. Dierk. Amsterdam, p. 104, 1913

(Sanoek and Mirdika River, Ambon).

Zenarchopterus dispar BLEEKER, Nederland, Tijds. vol. 3, p. 164, 1866 (Java, Sumatra, Batu, Billiton, Sangi, Celebes, Amboina, Goram); Atlas Ichth, Ind. Néerland, vol. 6, p. 63, pl. (7) 213, fig. 4 (same localities). -- JORDAN and SEALE, Bull, Bur. Fisher., vol. 26, p. 9, 1906 (1907) (Cavite). --EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, p. 59, 1906 (1907) (Bacon). --SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 240, 1907 (Zamboanga). --GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. , p. 358, 1909 (Ponapé , Guadalcanar, Samoa, Fiji). --BOULENGER, Cat. Fresh Water Fishes, Africa, vol. 3, p. 16, fig. (copied), 1915 (Seychelles, in fresh water). -- FOWLER, Copeia, no. 58, June 18, 1918, p. 62, (Philippines); Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 9 (Philippines). --WEBER and BEAUFORT, Fishes Indo Austral, Archipelago, vol. 4, p. 169,

fig. 58, 1922 (Simalur, Nias, Balikpapan, Borneo, Ambon, Nusa Laut). --MOHR, Zool. Jahrbücher, Jena, vol. 52, p. 254, fig. 16 (anal fin), 1926 (Saha, Admiralty Islands; Lindenhafen, New Pommerania; Ponapé). -- DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 42, p. 127, 1926 (Saha; Lindenhafen).-- FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 4, 1927 (Benkoelen, Sumatra). FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 263 (Bangued, Santa Maria, San Fernando, Vigan, Philippines); Journ. Bombay Nat. Hist. Soc., vol. 32, no. 4, p. 705, Mar. 11, 1928 (Ceylon); Men. Bishop Mus., vol. 10, p. 79, 1928 (Kusaie, Carolines; Strong Island; Suva); vol. 11, no. 5, p. 319, 1931 (Gauza River, Vanana Levu, Fiji).

Hemirhamphus commersonii (not VALENCIENNES)

PETERS, Reise Mossambique, vol. 4, p. 94,

1868 (part).

Zenarchopterus vaïsiganis JORDAN and SEALE,

Bull. Bur. Fisher., vol. 25, p. 208, fig.

11, 1905 (1906) (type locatlity: Vaisigano

River at Apia, Samoa).

? Zenarchopterus dux SEALE, Philippine Journ.

Sci., vol. 5, p. 267, pl. 2, fig. 2, 1911

(type locality: Sandakan, Borneo). --WEBER

and BEAUFORT, Fishes Indo Austral. Archipelago,

vol. 4, p. 169, 1922 (copied).

Zenarchopterus philippinus (not PETERS) FOWLER,

Copeia, no. 58, p. 62, June 18, 1918 (Philippines;

part).

Depth 8 to 9-3/4, moderately compressed; head 2½, head from snout tip 3-3/4 to 3-4/5, width 2-4/5 to 3. Snout 3 in head from snout tip; eye 3-7/8, 1-1/6 in snout, subequal with interorbital; maxillary reaches 7/8 to eye, length 3-1/5 to 3-1/3 in head from snout tip; interorbital 3-3/4 to 3-7/8, low, flat. Gill rakers 5 + 11, lanceolate, 1-1/5 in gill filaments, which 2½ in eye.

Scales 31 or 32 in lateral axial series from above gill opening to caudal base and 4 or 5 more on latter; 6 above, 1 below, 40 predorsal forward to snout end of which 25 forward to occiput above gill opening. Scales with 6 basal radiating striae; circuli moderate, more or less complete.

D. II, 10, first branched ray 5-4/5 to 6½ in total head length; A. II, 10, first branched ray 4-3/4? to 5; caudal 2½, convex behing; least depth of caudal peduncle 7-2/3 to 8-3/5; pectoral 3-1/8 to 3-1/5; ventral 6-1/5 to 6¼, origin about last third in space between front pupil edge and caudal base.

Brownish or drab, scarcely paler below. Iris neutral gray, evidently silvery white in life like sides of head. Dark line down predorsal region medially. Narrow gray lateral band axial from above gill opening to caudal base, most distinct between dorsal and anal and bordered above by dark line. Sides of head body under a lens seen sprinkled with dusky dots. Fins pale, dorsal and anal little darker terminally, anal blackish terminally.

Madagascar, Seychelles, India, Andamans, Siam, East Indies, Philippines, Queensland, Melanesia, Micronesia, Polynesia. Zenarchopterus dux Seale does not appear to differ in way from the present species. It is based on a single specimen 150 mm. long, evidently a female.

20206 to 20209. Alimango River, Burias Island. March 5, 1909. Length 74 to 129 mm.

1 example. Alimango River. March 6, 1909. Length 51 mm.

33 examples. Bacoor, Luzon. June 15, 1908. Length 31 to 170 mm.

1 example. Basiao Island, Samar. April 16, 1908. Length 41 mm.

1 example. Basud River, Luzon. June 15, 1909. Length 66 mm.

2 examples. Batan Island. July 22, 1909. Length 65? to 105 mm.

22178. Bubuan. February 14, 1908. Length 85? mm.

20 examples. Buena Vista, Guimaras Island. January 14, 1909. Length 75 to 190 mm.

6 examples. Busin Harbor, Burias Island. April 23, 1908. Lenght 58 to 135 mm.

1 example. Cabugao Bay, Catanduanes Island. June 6, 1909. Length 62 mm.

8 examples. Caiholo River, Ulugan Bay, Palawan Island. December 29, 1908. Length 95 to 150 mm.

26 examples. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length 82 to 154 mm.

1 example. Cataingan Bay, Masbate Island. April 18, 1908. Length 66 mm.

7 examples. Catbalogan, Samar Island. April 16, 1908. Length 87 to 123 mm.

7830. Cebu market. April 7, 1908. Length 111? mm.

7516. Cotabate, Mindanao. May 20, 1908. Length 193 mm.

23740 to 23742. Dumaca River, Luzon. February 25, 1909. Length 101 to 185 mm. 24 examples.

9 examples. East side Tagbalaran Strait, Bohol Island. April 9, 1908. Length 33 to 103 mm.

20476 to 20479. Endeavour Strait, mouth of stream at village near Chase Head, Palawan. December 22, 1908. Length 120? to 156 mm.

11924. Jolo market, Jolo. February 17, 1908. Length 130? mm.

11 examples. Jolo market. March 7, 1908. Length 129 to 170 mm.

5514, 22565. Malabon market. August 8, 1908. Length 95? to 100? mm.

19748 to 19752. Malampaya River, Palawan. December 26, 1908. Length 47 to 165 mm. 10 examples.

5 examples. Malcochin Harbor, Linapacan Island. December 18, 1908. Length 36 to 68 mm.

22338, 22339. Malinao River, Mantaquin Bay, Palawan. April 2, 1909. Length 112 to 152? mm.

2 examples. Malugas River, Mindoro. December 11, 1908. Length 105 to 124 mm.

19598. Manila harbor. January 13, 1908. Length 130 mm.

4525. Manila market. December 12, 1909. Length 82 to 150 mm. 4 examples.

62 examples. Mariquina River at Uaua. January 1, 1908. Length 30 to 62 mm.

8 examples. Matnog Bay, eastern Luzon. May 31, 1909. Length 43 to 80 mm.

19880. Montalban, San Mateo River, Luzon. December 1, 1907. Length 92? mm.

1 example. Montalban. January 1, 1908. Length 148 mm.

7 examples. Murcielagos Bay, Mindanao. August 20, 1909. Length 80 to 148 mm.

20081. Nakoda Bay, in river, Palawan. December 31, 1908. Length 81 to 164 mm. 3 examples.

1 example. Nato River. June 17, 1909. Length 58 mm.

1 example. Palvan River, Mindoro. December 11, 1908. Length 48 mm.

3 examples. Panabutan Bay, Mindanao. February 6, 1908. Length 126 to 138 mm.

8 examples. Pancol, Malampaya Island, Palawan. Length 113 to 175 mm.

86 examples. Pasacao, in river, Luzon. March 9, 1909. Length 70? to 185 mm.

14 examples. Philippines. Length 41 to 96 mm.

1 examples. Port Dupon, Leyte. May 6, 1908. Length 40 mm.

48 examples. Port Dupon. March 17, 1909. Length 68 to 170 mm.

5 examples. Port Jamelo, Luzon. July 13, 1908. Length 33 to 57 mm.

9 examples. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length 53 to 155 mm.

19 examples. Port San Vicente, Palaui River. November 14, 1908. Length 42 to 161 mm.

6566 to 6571. Port San Vicente. November 18, 1908. Length 120 to 150 mm. 12 examples.

13 examples. Pucot River, Mariveles. January 29, 1909. Length 85 to 151 mm.

20070 to 20072. Pucot River, backwater ponds, Mindanao. January 30, 1909. Length 87 to 133 mm.

2 examples. Ragay Bay, Ragay, Luzon. March 9, 1909. Length 38 to 45 mm.

19458, 19459, 19512 to 19514, 22020. Ragay River. March 10, 1909. Length 98 to 135? mm.

22582. Romblon. March 25, 1908. Length 126 mm.

21306. Romblon. March 26, 1908. Length 140 mm.

7 examples. San Antonio, Cavite, Luzon. June 27, 1908. Length 36 to 38? mm.

6 examples. San Antonio. July 30, 1908. Length 78 to 111 mm.

1 example. San Antonio. July 31, 1908. Length 20 mm.

2 examples. San Miguel, Ticao Island. April 2, 1908. Length 52 to 58 mm.

19671, 19673. Santa Cruz Island, Marinduque Island. April 24, 1908. Length 51 to 123 mm. 4 examples.

19 examples. Santiago River, Pagapas Bay, Luzon. February 20, 1909. Length 88 to 167 mm.

1 example. Sebatic Island. January 2, 1909. Length 72? mm.

2 examples. Sebatic Island. November 3, 1909. Length 81 to 89 mm.

1 example. Shore above Iloilo River. June 2, 1908. Length 34 mm.

1 example. Simalue Island. February 19, 1908. Length 83? mm.

2 examples. Tara Island. December 15, 1908. Length 32 to 35 ~~mm~~/

5 examples. Varadero Bay, Mindoro. July 24, 1908. Length 89? to 132 mm.

20 examples. West coast Palaui Island. November 18, 1908. Length 82 to 163 mm.

5 examples. Zamboanga canal. October 8, 1909. Length 76 to 93 mm.

1 example. Sandakan, Borneo. March 2, 1908. Length 156 mm.

A. N. S. P., nos. 48624 and 48625. Philippines.

Commercial Museum of Philadelphial Length 99 to 112 mm.

A. N. S. P., no. 51334. Colombo, Ceylon. 1924. Prof. F. Hallberg. Purchased. Length 155 mm.

Zenarchopterus buffonis (Valenciennes)

Hemiramphus buffonis VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 48, 1846 (type locality: Pulo Pinan). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 3, p. (690, 193) 711, 1852 (Wahai, north Ceram; Banka), p. 718 (Koba), 722 (name); p. 717 (Goessongassam), vol. 5, p. 154, 1853 (Macassar); vol. 9, p. 192 (Batjan), p. 493 (Amasing and Madawang Rivers, Batjan); vol. 15, p. 203, 1858 (Goram); vol. 16, p. 377, 1858 (Priaman); vol. 18, p. 361, 1859 (Blinju, Banka); Act. Soc. Sci. Ind. Néerland. (Achst. Sumat.) , vol. 18, p. 361, 1859 (Blinju, Banka); Act. Soc. Sci. Ind. Néerland (Achst. Sumat.), vol. 8, p. 55, 1859 (Benkulen and Priaman); Versl. Akad. Wet.

Amsterdam, vol. 12, p. 32, 1861 (Singapore).

--PETERS, Monatsb. Akad. Wiss. Wien, 1876

(1877), p. 848 (Segaar Bay). --WEBER, Zool.

Ergebn. Reise Nederland Ost Indië, vol. 3,

p. 456, 1894 (Singapore, Borneo, Banka,

Sumatra, Java, Celebes, Batjan, Ceram, Amboina).

--VOLZ, Nat. Tijds. Nederland Indië , vol.

56, p. 179, 1907 (Priaman and Benkulen). --

WEBER, Siboga Exp., vol. 57, Fische, p. 132,

1913 (Macassar).

Hemirhamphus buffonis GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 273, 1866 (East Indies). --DAY, Fishes of India, pt. 4, p. 516, pl. 119, fig. 4, 1878; Fauna Brit. India, Fishes, vol. 1, p. 427, 1889 (Bombay, Hooghly, Andamans, Malay, Archipelago, China?). --DUNCKER, Mitteil. Nat. Mus. Hamburg. vol. 21, p. 170, 1903 (1904) (Klang, Singapore, Kuala Selangor, Muar River, Changi). --HASE, Jena. Zeits. Naturw., vol. 51, p. 541, figs. 13 - 15, 1914 (Sepik, New Guinea).

Hemirhamphus (Zenarchopterus) buffonis --PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 274 (Singapore). --BEAUFORT, Bijd. Dierk. Amsterdam, p. 104, 1913 (Saonek and Bajon, Waigiu).

Zenarchopterus buffoni BLEEKER, Nederland Tijds.

Dierk., vol. 3, p. 162, 1866 (Java, Sumatra,

Pinang, Singapore, Banka, Borneo, Celebes,

Batjan, Ceram, Goram, New Guinea); Atlas

Ichth. Ind. Néerland, vol. 6, p. 62, pl.

(7) 254, fig. 3, 1866-72 (same localities). --

WEBER and BEAUFORT, Fishes Indo Austral.

Archipelago, vol. 4, p. 170, 1922 (Nias,

Simalur; Batavia, Semarang, Surabaya, Java;

Java Sea; Stagen, Balikpapan, Borneo; Flores;

Macassar, Maros, Tello river mouth, Celebes;

Ambon; Waigiu). --MOHR, Zool. Jahrbücher,

Jena, vol. 52, p. 260, 1926 (Panapé; Pelew

Islands; Varangoi River, Cape Pedar, Luschan

Harbor, Rein Bay, Tavanatangir Harbor Hanam

Harbor and Möwe Harbor, New Pomerania;

Papitalai and Bird Island Bay, Admiralty

Island; Dorperspitze, east of Long Island,

Langemak Bay and Kaiserin Augusta River, New

Guinea;) Java Sea, Noesa Laut, Singapore

--DUNKER, and MOHR, Mitteil.Zool. Mus. Hamburg, vol. 42, p. 126, 1926 (preceding localities).

--FOWLER, Mem. Bishop Mus., vol. 10, p. 79, 1928 (type of Zenarchopterus maculosus).

Zenarchopterus buffonis FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1905, p. 494 (Baram, Borneo).

--SEALE, Philippine Journ. Sci., vol. 5, no. 4, Oct. 1910, p. 267 (Borneo).

Hemiramphus cirrhatus DAY, Proc. Zool. Soc. London, 1873, p. 709 (type locality: Bombay).

Zenarchopterus maculosus GARMAN, Bull. Mus. Comp. Zool., vol. 39, p. 239, pl. 5, fig. 4, 1903 (type locality: Suva, Fiji Islands). --GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 359, 1909 (copied)

Depth 9, broad above and more or less flattened sides convergent below; head 2-1/10, head from snout tip 4¼, width 2½. Snout 2-4/5 in head from snout tip; eye 3-3/4, 1-2/5 in snout, 1½ in interorbital; maxillary reaches 7/8 to eye, length 2-7/8 in head from snout tip; interorbital 2-4/5, very low, only slightly convex. Gill rakers 5 14, lanceolate, equal gill filaments, which 2-4/5 in eye.

Scales 40 in axial lateral series from above gill opening to caudal base and 5 more on latter; 5 above, 2 below, 40 predorsal forward to front of snout of which 31 forward opposite hind eye edge. Dorsal and anal scaleless, Caudal base scaly. Scales with 10 short marginal striae basally; circuli rather coarse, basal, obsolete apically.

D. I, 12, first branched ray 5-3/4 in total head length; A. II, 8, first branched ray 6-4/5; caudal 3-1/8, apparently rounded behind; least depth of caudal peduncle 7; pectoral 4¼, ventral 9-2/3, origin little nearer caudal base than depressed pectoral tip.

Back pale brown, also sides and under surfaces which with silvery white tints. Narrow silvery band from close above pectoral base to middle of caudal, expanding between dorsal and anal until side as pupil. Sides sprinkled with dark brown dots, mostly evident under lens. Iris and sides of head silvery white. Each black cutaneous flap along side of mandible half to 2/3 width of same. Dorsal neutral black, other fins whitish.

India, Andamans, Malaya, East Indies, China?, Melanesia, Micronesia, Polynesia.

A. N. S. P., no. 55971. Baram, British North Borneo. 1898. Dr. W. H. Furness 3rd. Wistar Inst. Anatomy (13922). Length 165 mm.

Zenarchopterus novae guineae (Weber)

Hemirhamphus (Zenarchopterus) novae guineae

WEBER, Nova Guinea, vol. 9, pt. 4, p. 553, 1913 (type locality: Lorentz River; Verlaten Bocht; Regen Island; Rivierkamp; Biwak Island; Sabang; Alkmaar).

Zenarchopterus novae guineae WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 167, 1922 (Lorentz River and Kloofbivak, New Guinea). --MOHR, Zool. Jahrbücker, Jena, vol. 52, p. 247, fig. 12 (anal fin), 1926 (Lorentz River). --FOWLER, Mem. Bishop Mus., vol. 10, p. 78, 1928 (compiled).

Hemirhamphus buffonis (not VALENCIENNES) HASE,

Jena. Zeits. Naturw., vol. 51, p. 541, figs.

13-15, 1914 (Sepik, Kaiser Wilhelm Land, New

Guinea).

Depth 9-3/5 to 11-1/3, compressed, body width 2/3 its depth; head 2-1/3 to 2-2/5, head from snout tip 3 to 3-1/3. Triangular part of upper jaw scarcely longer than broad at base; eye equal to or somewhat smaller than interorbital space, 1½ to 1-4/5 in postorbital; beak beyond snout tip 3-9/10 to 4-4/5 in total length without caudal; teeth very small, pointed, forming bands, upper band of uniform width and lower band tapering forward; preorbital rounded in front, ½ to 2/3 of eye.

Scales 50 to 53 in lateral series.

D. 14, convex, 3 times long as anal, third fourth and fifth rays longest and none thickened; A. II, 8 or II, 9, convex, males with sixth ray swollen and posterior rays smaller than others, fin origin below third or fourth dorsal ray; caudal more or less truncate; pectoral rays I, 7 or I, 8, fin long as or somewhat longer than postorbital region; ventral rays I, 5, short, less ½ of pectoral, origin of fin about twice nearer caudal base than eye.

Yellowish, with silvery lateral band, bordered above by black stripe and widest in postanal region. Fins hyaline, caudal and dorsal dusky. Length 240 mm.

(Weber and Beaufort.)

East Indies.

Zenarchopterus quadrimaculatus Mohr.

Zenarchopterus qradrimaculatus MOHR, Zool. Jahrbücker, Syst., vol. 52, p. 257, fig. 18-19, 1926 (type locality: Selangor, Muar River, Malay Peninsula).

Depth 9½, deepest near end of pectoral; head 2, head from snout tip 3-3/5. Snout 2-4/5 in head from snout tip, upper jaw long as broad; eye 4, 1¼ in snout; mouth cleft reaches 3/4 to eye, length 3-1/5 in head from snout tip; interorbital low, apparently level.

Scales 42 in axial lateral series to caudal base and 2 more on latter; 5 above lateral line, predorsal 29 forward to eye. Dorsal and anal scaleless, caudal base scaly.

D. I. 13, uniformly high in both sexes, first branched ray 9-1/3 in total head; A. II, 10, male with sixth ray expanded and longest of fin, seventh half so long though also expanded, in female first branched ray 6-7/8 in total head length; caudal 3-1/3, slightly obliquely truncate behind; least depth of caudal peduncle 8; pectoral 4-1/8, rays 11; ventral less than eye, rays 6 or 7, fin origin but slightly before dorsal origin or at last third between hind edge of preopercle and caudal base.

Clear yellowish brown. Beak blackish, tip milk white in life. Each side of body close above dark later axial line 2 blackish spots, each about size of pupil, anterior little behind end of depressed pectoral and posterior little before dorsal origin. Dark lateral axial streak from head to caudal base and expanded below dorsal to caudal base where width 1/5 to $\frac{1}{4}$ least depth of caudal peduncle. Male with lower half of streak with many small ocellated flakes. Male with long, pointed anal papilla, in female rounded and smooth. Length 190 mm.

(Mohr.)

Malay Peninsula.

Zenarchopterus atrodorsalis new species

Depth 10; head 2, head from snout tip 3-2/3, width 2-3/4. Snout 2-3/4 in head from snout tip; eye 4, 1-1/3 in snout, 1½ in interorbital; maxillary reaches 7/8 to eye, length 2-9/10 in head from snout tip; interorbital 3, low, level. Gill rakers 4 + 15, lanceolate, equal gill filaments, which 2-3/4 in eye.

Scales 40 in axial lateral series to caudal base and 4 more on latter; 5 above, 1 below; 36 predorsal forward to front of snout, of which 26 forward to head. Caudal base scaly, otherwise fins naked. Scales with 6 basal radiating striae; circuli fine, obsolete apically.

D. I, 13, I, first branched ray 7¼ in total head length; A. 11, with 3 lobes of which second apparently longest (ends of rays of first lobe broken), sixth ray (or second lobe) expanded, greatly branched and 5¼ in head; caudal 3½, rounded; least depth of caudal peduncle 9-4/5; pectoral 5-2/5; ventral 8-7/8, origin midway between last fifth of depressed pectoral and caudal base.

Body brown, with coppery tinge. Axial dark gray line along side of body, bordering pale or light silvery band about wide as pupil and most distinct between dorsal and anal. Broad cutaneous flap all along each side of mandible black, in contrast with brown color of beak. Dorsal black. Caudal light or dull brown above, paler below. Fins otherwise pale to whitish.

Diagnosis. Known chiefly by it coloration, expecially the black dorsal and lateral membranes of the beak. The free part of the upper jaw is flat and slightly broader than long.

U. S. N. M., no. , type.
1 example. Sandakan, Borneo. February 29, 1908. By electric light. Length 125 mm. Type.

Zenarchopterus pappenheimi Mohr

Zenarchopterus pappenheimi MOHR, Zool. Jahrbücher, Syst., vol. 52, p. 258, fig. 20 (anal fin), 1926 (type locality: Bangkok).

? Hemiramphus buffonis (not VALENCIENNES) BLEEKER, Naturk. Tijds. Dierk., vol. 3, p. 711, 1952.

Upper jaw long as broad, length 6 in beak before snout tip.

D. 12 or 13, rays uniform, moderate; A. 11 or 12, rays in 3 lobes, first lobe shortest with 5 rays. sixth ray forms median lobe expanded and ending in point, also seventh and eight rays but little shorter than sixth and form front of third lobe while remaining much shorter than those of first lobe; pectoral rays 10; ventral rays 6. Anal papilla robust, ends in point.

Dark brown. Beak black. Small ringed blotch at caudal base. Greatest depth of silvery lateral band 1/5 to ¼ least depth of caudal peduncle. Dorsal membrane dark brown. Anal with little pigment in front. Caudal brownish. Paired fins colorless. Length 168 mm. (Mohr.)

Siam.

Zenarchopterus duncheri Mohr

Zenarchopterus dunckeri MOHR, Zool. Jahrbücher, Jena, vol. 52, p. 255, fig. 17 (fins), 1926 (type locality: Friedrich Wilhelm Harbor and Segaar Bay, New Guinea; Rein Bay, New Pomerania; Kewieng Musa, New Mecklenburg). --DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 42, p. 127, 1926 (types). --FOWLER, Mem. Bishop Mus., vol. 10, p. 79, 1928 (compiled).

Hemiramphus dispar (not VALENCIENNES) BLEEKER, Naturk.Tijds. Nederland Indië, vol. 6, p. 498, 1854 (Amboina). --KNER, Sitz. Ber. Akad. Wiss. Wien, Math.-nat. Kl., vol. 30, p. 537, fig. 3, 1860.

Upper jaw long as broad, 7 or 8 in lower jaw.

D. 10 or 11, fourth ray strong, extended and expanded, reaches beyond hind end of fin; A. 11 or 12, in 3 sections, first to fifth pigmented, sixth more than double third, greatly expanded medially, third section little longer than first or only 2/3 of median or second section (in small examples median section but little longer than others); pectoral rays 10; ventral rays 6.

Dark brown. Blackish pigment on back. Beak dark brown, in life end red. Fins clear. Dorsal membranes pigmented, other fins only with rays pigmented. Width of lateral streak on side of tail 1/5 to $\frac{1}{4}$ depth of caudal peduncle.

Length 190 mm. (Mohr.)

East Indies, Melanesia.

Zenarchopterus beauforti MOHR,

Zenarchopterus beauforti MOHR, Zool. Jahrbücher, Syst., vol. 52, p. 259, fig. 21 (fins), 1926 (type locality: Muar River, Selangor, Malay Peninsula).

? Hemiramphus striga (not VALENCIENNES) BLYTH,

Journ. Asiatic Soc. Bengal, vol. 27, p. 288,

1859.

Upper jaw long as broad, $7\frac{1}{2}$ in lower jaw before snout tip.

D. 11 or 12, rays of uniform equal height, none modified; A. 9 in male, form 2 lobes with third ray longest in first lobe and first ray longest in second lobe or only slightly thickened; pectoral rays 10 or 11; ventral rays 6. Male with large anal papilla, small in female.

Clear yellowish, with very little dark pigment, which along back. Beak dark brown. Silvery lateral band width $\frac{1}{4}$ to 1/3 least depth of caudal peduncle, sharp below dorsal. Dorsal sparsely pigmented along rays. Also smaller but more contrasted dark dots at middle of caudal rays. Caudal, anal and paired fins colorless. Length 110 mm. (Mohr.)

Malay Peninsula.

Zenarchopterus kneri new species

Hemirhamphus dispar (not VALENCIENNES) KNER, Sitzs. Ber. Akad. Wiss. Wien, vol. 39, p. 537, fig. 3, 1860 (East Indies).

Hemiramphus dispar MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 593, 1882 (New Guinea).

Hemirhamphus (Zenarchopterus) dispar BEAUFORT, Bijd. Dierk. Amsterdam, vol. 19, p. 104, 1913 (Saonek, Waigiu).

Zenarchopterus dispar GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 358, 1909 (Ponapé, Guadalcanar, Samoa, Fiji). -- KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 252, 1911 (Kusai, Suva, Guam).-

Hemirhamphus brevirostris (not CUVIER) GUNTHER, Cat. Fishes Brit. Mus., vol. 6, 1866, p. 274 (on Kner). --STEINDACHNER, Abhand. Senckenberg. Ges., vol. 25, p. 450, 1900 (1901) (Batjan).

Zenarchopterus brevirostris BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 64, 1866-72 (copied). --MOHR. Zool Jahrbücher Jena, vol. 52, p. 250, 1926(Dorperspitze, New Guinea; Liebliche Island, Linden Harbor and Rien Bay, New Pamerania; New Lauenburg; Papitalai, Saha, Drugul and Bird Island Bay, Admiralty Islands; Saonek, Waigiu; Poeloe Belang, Borneo; Changi, Singapore; Madagascar; Mozambique). --DUNCKER and MOHR, Mitt. Zool. Mus. Hamburg, vol. 42, p. 127, 1926 (Mohr's materials). --FOWLER, Mem. Bishop Mus., vol. 10, p. 78, 1928 (compiled).

Depth 7-7/8; head 2-2/5. Snout 3 in head from snout tip, width 1-2/5; eye 4-3/4, 1½ in snout, 1½ in interorbital; maxillary reaches 7/8 to eye, length 3 in head from snout tip; interorbital 3, very low, nearly level.

Scales 30 in axial lateral series from above gill opening to caudal base and 2 more on latter; 6 transversely at dorsal origin.

D. I, 10 or 11, fourth ray in male prolonged and thickened, 2-2/3 in total head length; A. 13, sixth ray in male prolonged and thickened, 1-4/5 in total head, also with additional filamentous rays; caudal 2, elongate, rounded behind; least depth of caudal peduncle 6-1/5; pectoral 3-3/4, rays 9; ventral nearer caudal base than pectoral base.

Sides with silvery band. (Kner.)

East Indies, Melanesia, Polynesia, Micronesia. Although no dimensions are given in the original account of this species by Kner his figure measures 133 mm.

The name Zenarchopterus kneri is here proposed for this species as Hemirhamphus brevirostris Günther, the hitherto accepted name is preoccupied by Hemiramphus brevirostris Cuvier.

For Rudolf Kner, the distinguished Zoologist of Vienna during the middle of the nineteenth century, who first describes and figures the present species.

Zenarchopterus philippinus (Peters)

Hemirhamphus (Zenarchopterus) philippinus

PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 273 (type locality: Quingoa River, Luzon; Calbigan, Samar).

Zenarchopterus philippinus (BLEEKER), Atlas. Ichth. Ind. Néerland, vol. 4, p. 63, 1866-72 (copied). --EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, p. 59, 1906 (1907) (Bacon). --SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 240, 1907 (Zamboanga). --FOWLER, Copeia, no. 58, p. 62, June 18, 1918 (Philippines; part); Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 9 (Philippines).

Hemiramphus (Zenarchopterus) kampeni WEBER,

Nova Guinea, vol. 9, pt. 4, p. 554, 1913

(type locality: Kaiserin Augusta River,

Pioneer Biwak, northern New Guinea).

Zenarchopterus kampeni WEBER and BEAUFORT, Fishes

Indo Austral. Archipelago, vol. 4, p. 167, 1922

(Kaiserin Augusta River).-- FOWLER, Mem. Bishop

Mus., vol. 10, p. 78, 1928 (New Guinea); vol.

11, no. 5, p. 319, 1931 (Morovo Lagoon,

Solomon Islands).

Zenarchopterus kampenii MOHR, Zool. Johrbücher,

Jena, vol. 52, p. 248, figs. 13-14, (anal fin)

1926 (Kaiserin Augusta River and Ramu). --DUNCKER

and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 42,

p. 127, 1926 (Kaiserin Augusta River).

? Hemirhamphus buffonis (not VALENCIENNES) HASE,

Jena Zeits. Naturw., vol. 51, p. 541, 1914.

Zenarchopterus amblyurus (not BLEEKER) MOHR,

Zool. Jahrbücher, Jena, vol. 52, p. 243,

1926 (part)

Zenarchopterus dispar (not VALENCIENNES) FOWLER,

Proc. Acad. Nat. Sci. Philadelphia, 1927, p.

263 (Philippines; part).

Depth 8-3/4 to 9-1/3, body moderately compressed; head 2-2/5 to 2½, head from snout tip 3-3/4 to 4, width 2-7/8 to 3. Snout 3 to 3-1/5 in head from snout tip; tip eye 4 to 4-3/4, 1-2/5 to 1½ in snout, 1 to 1¼ in interorbital, maxillary extends 4/5 to eye, length 3¼ to 3½ in head; from snout tip interorbital 4 to 4-1/8, low, level. Gill rakers 3 or 4 + 10 or 11, 2/5 to 1/3 of gill filaments, which 1-4/5 in eye.

Scales 49 or 50 in axial lateral series from above gill opening to caudal base and 4 more on latter; 7 above, 1 or 2 below, 42 or 43 predorsal forward to end of snout, of which 31 or 32 forward to occiput. Dorsal and anal scaleless, caudal base scaly. Scales with 5 to 8 basal striae, little divergent; circuli moderate, little less distinct apically.

D. I, 13, in males fourth branched ray extended somewhat or 2-3/4 or 2-4/5 in total head length, in females first branched ray longest or 5¼ to 5½; A. I, 11 or I, 12 , in males and females apparently first branched ray longest or 4-3/4 to 4-7/8; caudal 2½ to 2-3/4, hind edge slightly concave, nearly truncate when expanded; least depth of caudal peduncle 8½ to 8--4/5; pectoral 3 to 3-1/8; ventral 5¼ to 5½, inserted about last third in space between hind eye edge and caudal base.

Light brown above, paler and with silvery tints on sides and below. Scales on back without dark edges. Silvery brown lateral band, bordered by dark brown line above its whole extent, greatest width between dorsal and anal half of eye. Iris dark gray, evidently silvery white in life. Dorsal and caudal brownish former also dark basally, other fins paler.

Philippines. This species well described by Peters and my specimens agree entirely. Characteristic are the prolonged fourth branched dorsal ray, the increased dorsal rays and the structure of the anal. I fail to find any very tangible for mantaining Hemiramphus (zenarchopterus) kampeni Weber as distinct. The fin structure as given by Mohr seems to me in agreement.

2 examples. Laguna de Bay, at head of River, Luzon. June 21, 1908. Length 110 to 122 mm.

A. N. S. P., nos. 48853 to 48858. Philippines. Commercial Museum of Philadelphia. Length 135 to 149 mm.

A. N. S. P., nos. 33271 to 33275. Tarlac, Bacon, Luzon. C. J. Pierson. Bureau of Fisheries. Length 74 to 140 mm.

Zenarchopterus basudensis new species

Depth 8¼ to 8-3/5; head 2¼ to 2-1/3, head from snout tip 2-4/5 to 2-7/8, width 2-2/3 to 2-4/5. Snout 2-7/8 to 3 in head from snout tip; eye 4-1/5 to 4¼, 1-1/3 to 1½ in snout, 1-1/5 to 1¼ in interorbital; maxillary reaches 7/8 to eye, length 3-1/8 to 3-1/3 in head from snout tip; interorbital 3¼ to 3-2/5, low, only very slightly convex. Gill rakers 3 + 13, lanceolate, strong, 2/5 of gill filaments, which 1-2/3 in eye.

Scales 53 to 54 in axial lateral series and 5 or 6 more on latter; 6 above lateral line to dorsal origin, 3 below, 32 or 33 predorsal forward to occiput. Scales with 6 short marginal slightly radiating basal striae; circuli fine, largely basal.

D. I, 12, fifth branched ray in male prolonged or not quite reaching back far as tip of tenth branched ray when depressed or to end of last ray length 3-7/8 to 4 in total head length; A. I, 11 or I, 12, sixth ray in male expanded though not quite long as first or anterior lobe, which 4¼ to 5-1/3 in total head, posterior lobe shortest; caudal 3, very slightly concave obliquely, when expanded obliquely truncate; least depth of caudal peduncle 8-1/5 to 9¼; pectoral 3-1/3; ventral 6½ to 6¼, inserted much nearer caudal base than pectoral base.

Back brown extending down to axial bright silvery white band fading fading imperceptably pale with whitish tints below. Sides of head and iris bright silvery white, also posterior sides of mandible. Beak dusky to blackish. Dorsal and caudal grayish, former with broad blackish basal band. Other fins all more or less whitish.

Diagnosis. Apparently distinct in having the fifth branched dorsal ray prolonged and the structure of the anal, in which the front lobe longest.

U.S.N.M., no. , type.

6 examples. Basud River, Luzon, in fresh water. June 15, 1909. Length 138 to 202 mm, largest type, others paratypes.

Zenarchopterus caudovittatus (Weber)

Hemiramphus (Zenarchopterus) caudovittatus

WEBER, Nova Guinea, vol. 5, pt. 2, p. 229, pl. 13, figs. 1a-b, 1908 (type locality: mouth of Merauke River, New Guinea).

Zenarchopterus caudovittatus WEBER and BEAUFORT,

Fishes of Indo Austral. Archipelago, vol. 4,

p. 164, 1922 (type) --MOHR, Zool. Jahrbücher,

Jena, vol. 52, p. 242, fig. 10 (fin), 1926

(Merauke, New Guinea; Kwala Selangor).
:/--FOWLER, Mem. Bishop

Mus., vol. 10, p. 78, 1928 (copied).

Depth 9, body compressed; head 2-3/4, head from snout tip 4¼, width 6-1/3. Snout 2 in head from snout tip; eye 5-7/8, 2-7/8 in snout, subequal with interorbital; maxillary about 2-1/3; interorbital about 4½, low level.

Scales 43 in axial lateral series from head to caudal base medially and 3 more on latter; 5 above. 32 predorsal forward to occiput over gill opening. Dorsal and anal scaleless, caudal base scaly.

D. I, 11, first branched ray 4½ in total head; A. II, 10, second branched ray 4-1/5; caudal 2-1/3, convex behind; least depth of caudal peduncle 6-2/3; pectoral 2½; ventral about 5, origin near last third in space between front eye edge and caudal base.

Brownish. Light lateral axial streak or line above pectoral origin and gill opening to caudal base, from below dorsal as blackish streak and on caudal base as 2 or 3 short vertical bars or spots medially. Eye dark. Fins pale, front anal edge and lower caudal edge dark.

Length 160 mm. (Weber)

New Guinea, fresh waters. According to Mohr the dorsal rays are of equal and uniform height and only the fourth anal ray expanded terminally, apparently not forming a distinct median section to the fin.

Zenarchopterus ectuntio (Buchanan-Hamilton)

Esox ectuntio BUCHANAN-HAMILTON, Fishes of Ganges, pp. 212, 380, 1822 (type locality: smaller rivers and ponds of Gangetic provinces).

--HORA, Mem. Ind. Mus., vol. 9, no. 4, p. 188, pl. 21, fig. 1, Nov. 1929.

Hemiramphus ectunctio BLEEKER, Verh. Batav. Genoot. (Beng. Hind.), vol. 25, p. 14, 1853 (on Buchanan-Hamilton). --BLYTH, Proc. Asiatic Soc. Bengal, vol. 27, p. 287, 1858.

Hemirhamphus ectunctio DAY, Fishes of India, pt. 3, p. 517, pl. 119, fig. 6, 1877; Fauna Brit. India, Fishes, vol. 1, p. 427, 1889.

Hemirhamphus ectuntio VINCIGUERRA, Ann. Mus. Civ. Genova, ser. 2, vol. 9, p. 349, 1890 (Rangoon).

Zenarchopterus ectuntio WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 165, 1922 (Samarinda and Ribo River, Borneo).

--FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 270, fig. 15, Dec. 1932 (East Indies).

Hemiramphus amblyurus BLEEKER, Verh. Batav. Genoot. (Madura), vol. 22, p. 11, 1849 (type locality: Madura Straits near Kammal and Surabaya); p. 5 (Kammal). --STEINDACHNER, Sitzs. Ber. Akad. Wiss. Wien, vol. 55, pt. 1, p. 592. 1867 (Hong Kong). --WEBER, Zool. Ergebn. Reise Nederland Ost Indië, vol. 3, p. 456, 1894 (Borneo, Sumatra, Madura).

Hemirhamphus amblyurus GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 273, 1866 (Siam; type). --KÁROLI, Termesz. Füzetek, Budapest, vol, 5, p. 152, 1881 (Change, Siam). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 184, 1881 (Port Darwin). --VOLZ, Zool. Jahrb. Abth. Syst., vol. 19, p. 395, 1903 (Sumatra); Nat. Tijds. Nederland Indië, vol. 56, p. 179, 1907 (Palembang).

Zenarchopterus amblyurus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 160, 1866 (Java, Madura, Borneo, Sumatra); Atlas Ichth. Ind. Néerland, vol. 6, p. 61, pl. (4) 250, fig. 1, 1866-72 (same localities). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1905, p. 494 (Baram, Borneo) --MOHR, Zool. Jahrbücher, Syst., vol. 52, p. 243, 1936 (Muar River; Kwala Selangor; Sumatra; Borneo; Formosa).

Hemiramphus borneensis BLEEKER, Nat. Tijds.

Nederland Indië, vol. 1, p. (260, 262) 273,

1850 (1851) (type locality: Bandjermassing);

vol. 2, p. (58, 63) 64 (194), 1851 (Bandjermassing);

Verh. Batav. Genotts. (Snoek: Vissch.), vol.

24, p. 25, 1852 (Bandjermassing); Nat. Tijds.

Nederland Indië, vol. 3, p. 409, 1852

(Bandjermassing); vol. 8, p. 152, 1855

(Bandjermassing); vol. 9, p. 418, 1855

(Bandjermassing); vol. 16, p. 338,1858

(Palembang, Sumatra); Act. Soc. Sci. Ind.

Néerland (Achst Sumat.),vol. 8, p. 55, 1859

(Palembang); Nederland Tijds. Dierk., vol.

2, p. 35, 1865 (Siam); p. 176 (Siam; copied).

Hemirhamphus bleekeri KNER, Sitzs. Ber. Akad. Wiss. Wien, Math. - nat. Kl., vol. 39, p. 539, fig. 4, 1860 (type locality: no locality).

Hemirhamphus neglectus (not BLEEKER) DAY, Proc. Zool. Soc. London, 1869, p. 526.

? Hemiramphus rasori POPTA, Notes Leyden Mus., vol. 34, p. 192, 1912 (type locality: Rahat Muna, Celebes).

Zenarchopterus rasori WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 166, 1922 (type).

Zenarchopterus hendersoni FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 8, fig. 2 (type locality:"Japan"[possibly erroneous for East Indies]).

Zenarchopterus clarus MOHR. Zool. Jahrbücher, Syst., vol. 52, p. 241, 1926 (type locality: Bangkok).

Depth 11? to 12 3/4, back rather broad, flattened sides somewhat approximated below; head 2 1/5 to 2½?, head from snout tip 3 4/5 to 4, width 3 3/4 to 4. Snout 2¼ to 2½ in head from snout tip; eye 5 to 5¼, 2 to 2 1/3 in snout, 1 1/5 in interorbital; maxillary reaches about 7/8 in snout, length 2½ to 2 3/5 in head from snout tip; interorbital 4 1/5 to 4¼, low, level. Gill rakers 5 + 11, lanceolate, 2/3 of gill filaments, which 2 1/3 in eye.

Scales 45 to 46 in lateral axial series from above gill opening to caudal base and 3 or 4 more on latter; 5 above lateral line, 1 below, 45 predorsal forward to front of snout of which extend forward far as gill opening. Vertical fins with few small scales anteriorly about bases, caudal scaly basally. Scales with 4 to 6 basal radiating striae; circuli moderate, basal, obsolete apically.

D. I, 12, first branched ray 6 3/4 to 7? in total head length; A. II, 9, first branched ray 5½; caudal 3 1/5, rounded behind; least depth of caudal peduncle 8; pectoral 4½? to 5; ventral 8? to 8¼, inserted slightly behind last third in space between hind eye edge and caudal base.

Brownish, lower surfaces little paler and with silvery tints. Under lens back seen sprinked with fine dark dots. Iris and sides of head silvery white. Obscure gray line axial along side, borders very narrow silvery white band on side of tail between dorsal and anal, where wide as pupil. Top of head, snout and beak brownish. Dorsal and caudal tinted with brownish terminally, other fins more or less whitish.

India, Burma, Malaya, Siam, East Indies, China, Formosa, North Australia. Although Zenarchopterus hendersoni Fowler is likely a synonym as Mohr doubtfully suggests the original label still clearly shows "Japan" as the locality. Possibly it may have been obtained somewhere in the East Indies?

Zenarchopterus clarus Mohr based on two females 150 to 165 mm, is likely this species. It is described with upper jaw twice as long as broad, D. 13 or 14, A. 11.

A. N. S. P., no. 7584. "Japan". Dr. A. A. Henderson. Length 142 mm. Type of Zenarchopterus hendersoni.

A. N. S. P., no. 55972. Boram, British North Borneo. 1898. Dr. W. H. Furness 3 rd. Wistar Institute of Anatomy. Length 140 mm. to end of broken beak.

Genus Hyporhamphus Gill

Hyporhamphus GILL, Proc. Acad. Nat. Sci. Philadelphia, 1859, p. 131. (Type Hyporhamphus tricuspidatus GILL, monotypic).

Eulepidorhamphus FOWLER, Proc. Adad. Nat. Sci. Philadelphia, 1919, p. 7. (Type Hemiramphus sajori SCHLEGEL, orthotypic.)

Body elongate, but moderately compressed, sides swollen more or less convex, not flattened. Young with lower jaw short, long and beak like with age. Teeth feeble, mostly tricuspid. Air bladder large, simple, not cellular. Dorsal and anal alike opposite, not modified in male, last dorsal ray usually short. Caudal mostly forked, lower lobe longer. Ventral small, inserted well forward, nearly midway between opercle and caudal base.

Numerous species in all warm seas, living in large schools usually not far from shore. Food largely green algae.

Hyporhamphus gernaerti (Valenciennes)

Hemiramphus gernaerti VALENCIENNES, Hist. Nat. Mus., vol. 19, p. 43, 1846 (type locality: China, Macao).

Hemirhamphus gernaerti GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 268, 1866 (copied). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference). --ELERA, Cat. Fauna Philip., vol. 1, p. 575, 1895 (Luzon, Manila, Navotas).

Hyporhamphus gernaerti CHU, Biol. Bull. St. John's Univ., no. 1, p. 86, Jan. 1931 (reference). --FOWLER, Hong Kong Naturalist, vol, 3, nos. 3-4, Dec. 1932, f. 265 (compiled).

Beak 5 in total length; teeth fine, pointed; interorbital equals eye. D. 13; A. 15; both dorsal and anal small and low; caudal but little forked. Belly brown like back. Flanks silver gray. Lateral band very broad between dorsal and anal. Length 178 mm.

(Valenciennes).

This little known species not seen since originally described. The short beak and few fin rays appear to be characteristic features.

Analysis of Species

a[1]. Hyporhamphus. Scales 40 to 60 in lateral series.

b[1]. Ventral origin midway between front edge or hind edge of eye and caudal base.

c[1]. Caudal with hind edge black.

d[1]. Head from smout tip 3 1/5.----------

----------unifasciatus.

d[2]. Head from upper jaw tip 3½ to 3 2/3.----------gaimardi.

c[2]. Caudal tips black; head from snout tip 2 2/3 to 4.----------melanurus.

c[3]. Caudal uniform, without black.

e[1]. No black spot at pectoral base.

f[1]. Upper jaw broader than long; D. 15 or 16; A. 15 to 18; scales 55 to 58.

g[1]. Head 3 1/5; Australian.------

----------regularis.

g[2]. Head 2 2/3; Chinese.----------

----------sinensis.

f[2]. Upper jaw long as wide; D. 14; A. 15; scales 50 to 55.------

----------sindensis.

f^3. Upper jaw little longer than wide; D. 15, A. 16; scales 56 to 58.----------xanthopterus.

e^2. Faint black spot at pectoral base.

b^2. Ventral origin more posterior, midway between gill opening and caudal base.

h^1. Anal rays 12 to 14.--------

--------------------quoyi.

h^2. Anal rays 16 to 18.

i^1. Head 2½ to 2 2/3.--------

----------balinensis.

i^2. Head 2 2/3 to 2 3/4.-----

----------pacificus.

i^3. Head over 3.------acutus.

a^2. Eulepidorhamphus. Scales 90 to 106; D. 16; A. 16 or 17.----------sajori.

Hyporhamphus unifasciatus (Ranzani)

Hemiranphus unifasciatus RANZANI, Nov. Comm. Acad. Sci. Bonan., vol. 5, p. 326, 1842 (type locality: Brazil). (error).

Hemirhamphus unifasciatus GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 262, 1866 (Mauritius; East Indies). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 59, 1866-72 (Java, Sumatra, Amboina). --DAY, Fishes of India, pt. 3, p. 514, 1877; Fauna of Brit. India, Fishes, vol. , p. , 1889. --VOLZ, Nat. Tijds. Nederland Indië, vol. 46, p. 178, 1907 (Padang). --WEBER, Siboga Exp., Fische, vol. 57, p. 131, 1913 (south east Timor). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 149, 1922 (Java Sea; Samarang; Batavia; Weber's material). --DUNCKER and MOHR, Mitteil. Nat. Mus. Hamburg, vol. 42, p. 126, 1926 (Hansa Bay, New Guinea).

Hemiramphus unifasciatus SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). --DAY, Fauna Brit. India, Fishes, vol. 1, p. 426, 1889. --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 261 (San Fernando, Virgan, Orani, Philippines); Mem. Bishop Mus., vol. 10, p. 75, 1928 (compiled); Ann. Nat. Mus., vol. 6, pt. 2, p. 250, May 1929 (False Bay, Natal); Proc. U.S.Nat. Mus., vol. 80, art. 6, p. 6, 1932 (Charles Island, Galapagos).

? Hemiramphus schlegeli BLEEKER, Nat. Verh. Moats. Wet. Hoarlem, vol. 18, p. 120, pl. 25, fig. 1, 1863 (type locality: Guinea, Ora-aurifer).

Hemirhamphus neglectus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 157, 1866 (Java, Sumatra, Amboina); Atlas Ichth. Ind. Néerland, vol. 6, pl. (8) 254, fig. 5, 1866-72.

Hemiramphus neglectus JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, p. 243, 1907 (1908) (Aparri).

Hyporhamphus neglectus FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 501, 1904 (Padang); Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 6 (Padang material).

? Hemirhamphus calabaricus GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 266, 1866 (type locality: Old Calabar and West Africa).

Hemiramphus capensis THOMINOT, Bull. Soc. Philomath. Paris, ser. 7, vol. 10, p. 166, 1886 (type locality: Cape of Good Hope).

Dermatogenys viviparus (not PETERS) FOWLER,

Copeia, no. 58, p. 62, June 18, 1918

(Philippines; part).

? Hemirhamphus (Hyporhamphus) delagoae BARNARD,

Ann. Mag. Nat. Hist., ser. 9, vol. 15, p.

498, 1925 (type locality: Delagoa Bay);

Ann. South Afr. Mus., vol. 21, p. 263, pl.

10, fig. 6, 1925.

Hemirhamphus delagoae BARNARD, Ann. South Afr.

Mus., vol. 21, pt. 2,p. 1022, Oct. 1927

(reference).

Depth 8 3/4 to 9 3/5, compressed, sides flattened; head 2½ to 2 3/4, head 4 1/6 to 4 1/3 in length from snout tip, width 3 to 3 1/8. Snout 2 3/4 to 2 4/5 in head from snout tip; eye 3 3/5 to 3 2/3, 1 1/3 to 1 2/5 in snout, subequal with or slightly greater than interorbital; maxillary reaches 3/4 in snout to eye, length 3 2/5 to 3½ in head from snout tip; interorbital 3 3/4 to 4, level. Gill rakers 10 + 19 to 21, lanceolate, ½ of gill filaments, which 1 4/5 in eye.

Scales (pockets) 54 to 56 in axial lateral series from above gill opening to caudal base and 6 or 7 more on latter; 5 above, 2 below, 32 or 33 predorsal forward to occiput. Vertical fins covered with small scales basally. Scales with 3 short basal slightly radiating striae; circuli rather fine, especially apically.

D. II, 13, first branched ray $4\frac{1}{4}$ to $4\frac{1}{2}$ in total length of head; A. II, 14 or II, 15, first branched ray 4 1/5 to 5; caudal 1 7/8 to 2 1/5, well forked behind with lower lobe longer; least depth of caudal peduncle 7 3/4 to 8; pectoral 2 7/8 to 3; ventral 5 3/4 to 6, origin about midway between vertical edge of preopercle and caudal base.

Back brown, sides and below paler. Iris and side of head silvery white. Narrow silvery white streak from above pectoral base to middle of caudal base, greatest width between dorsal and anal about equals pupil diameter, and sometimes edged all along above by narrow gray bordening line. Fins all pale brown.

South Africa, Natal, Maurituis, Portuguese East Africa, India, East Indies, Philippines. Also in the Eastern Pacific, about the Galapagos and west coast of Mexico, and in the Atlantic, both the West Indies and West Africa.

(Singapore). vol. 16, p. 273 (Benkoelan), 1858; Act. Soc. Sci. Ind. Néerland (Acht. Sumat.), vol. 8, p. 55, 1859 (Benculen, Padang, Priaman). --KNER, Reise Novara, Fische, p. 323, 1865 (Java, Madras, Sydney). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 60, pl. ( ) 253, fig. 5, 1866-72 (Java, Sumatra, Nias, Pinang, Singapore, Bintang, Banka, Borneo, Celebes, Ternate, Amboina, New Guinea). --WEBER, Zool. Ergebn. Reise. Nederland Ost Indië, vol. 2, p. 456, 1894 (Singapore, Borneo, Banka, Sumatra, Nias, Java, Celebes, Amboina, Ternate). --FOWLER, Mem. Bishop Mus., vol. 10, p. 75, 1928 (Guam).

Hemirhamphus gaimardi GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 263, 1866 (East Indies). --VOLZ, Nat. Tijds. Nederland Indië, vol. 66, p. 178, 1907 (Priaman, Padang, Benkulen). --SEALE, Philippine Journ. Sci., vol. 5, no. 4, p. 267, Oct. 1910 (Borneo). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 150, 1922 (Bagan Api Api, Java Sea; Batavia, Semarang, Java; Madura; Balikpapan and Kota Baru, Borneo).

Hemirhamphus gaimardii MC CULLOCH, Fishes New South Wales, ed. 2, p. 31, 1927 (reference to Port Jackson record).

A. N. S. P., no. 27463. Padang, Sumatra. A. C. Harrison and H. M. Hiller. Length 135 mm.

A. N. S. P., no. 51333. Colombo, Ceylon. 1924. Prof. F. Hallberg. Purchased. Length 135 mm.

Hyporhamphus gaimardi (Valenciennes)

Hemiramphus gaimardi VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 362, 1846 (type locality: Moluccas; Amboina; New Guinea; Port Jackson). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 2, p. 472, 1851 (Rio); Verh. Batav. Genoot. (Snoek. Vissch.), vol. 24, p. 20, 1852 (Batavia); Nat. Tijds. Nederland Indië, vol. 3, p. 489, (Pamangkat), p. 445 (Banka), p. 722 (Borneo), 1852. vol. 7, p. 227, 1854 (Macassar); vol. 9, p. 283, 1855 (Macassar); vol. 12, p. 193, 1856 (Ternate), p. 217 (Nias); Act. Soc. Sci. Ind. Néerland, vol. 1, no. 3, p. 6, 1856 (Manado); vol. 2, no. 7, p. 7, 1857 (Amboina); vol. 3, no. 9, p. 3, 1857-58 (Padang); Nat. Tijds. Nederland Indië, vol. 15, p. 243, 1858

Hemiramphus limbatus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 44, 1846 (type locality: Malabar; Pandicherry). --BLEEKER, Verh. Batav. Genoots. (Snoek. Vissch.), vol. 24, p. 27, 1852 (Pinang; on Cantor); (Beng. Hind.), vol. 25, p. 72, 1853 (compiled). --DAY, Fishes of Malabar, p. 169, 1865. --JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, p. 243, 1907 (1908) (Cuyo). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 3, (Philippines); Copeia, no. 58, p. 62, June 18, 1918 (Philippines); Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 261 (Philippines). --WU, Contrib. Biol. Lab. Sci. Soc. China, vol. 5, no. 4, p. 64, fig. 52, 1929 (Amoy).

Hemirhamphus limbatus GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 272, 1866 (Ceylon; Pinang). --DAY, Fishes of India; pt. 3, p. 516, pl. 119, fig. 3, 1877; Fauna Brit. India, Fishes, vol. 1,p. 426, 1889 --DUNCKER, Mitteil. Zool. Mus. Hamburg, vol. 21, p. 170, 1903 (1904) (Singapore); vol. 29, p. 257, 1911 (Vakvilla, Ceylon).

Hyporhamphus limbatus FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 266, fig. 11, Dec. 1932 (Amoy).

Hemiramphus tridentifer CANTOR, Journ. Asiat. Soc. Bengal, vol. 78, pt. 1, p. 1231, 1849 (1850) (type locality: Pinang). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 1, p. 481, 1850 (1851), (copied).

Hemiramphus brachynopterus (not BLEEKER) BLYTH, Proc. Asiatic Soc. Bengal, vol. , p. 288, 1858.

Hemiramphus viridis (VAN HASSELT; not 1823?) BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 60, 1866-72 (name in synonymy).

Esox angulatus (BUCHANAN-HAMILTON) DAY, Fishes of India, pt. 3, p. 516, 1877 (name in synonymy).

Dermatogenys viviparus (not PETERS) FOWLER, Copeia, no. 58, p. 62, June 18, 1918 (Philippines; part).

Depth 7 2/3 to 10, rather robust to subcylindrical or only slightly compressed; head 2 4/5 to 2 7/8, from snout tip 4 to 4 2/5, width 2½ to 3, from mandible tip 4 1/8 to 5 3/5. Snout 2 3/5 to 3 in head from snout tip; eye 3½ to 4 1/5, 1¼ to 1 3/5 in snout, 1 to 1 1/10 in interorbital, 1 2/5 to 1½ in postocular; maxillary reaches 3/4 to eye, length 3 to 3 3/5 in head from snout tip; mandible before snout tip 6 to 8 1/5 in total; interorbital 2 7/8 to 3 3/4, low, nearly level. Gill rakers 6 or 7 + 17 or 18, short, ½ of gill filaments, which 2 1/5 in eye.

Scales 44 to 52 in axial lateral row to caudal base and 4 or 5 more on latter; 6 above, 47 to 50 predorsal of which 30 to 32 forward opposite gill opening. Dorsal, anal and caudal finely scaly. Scales with 4 or 5 short basal radiating marginal striae; circuli 30 to 50 basally, not extended apically.

D. II, 12, I, or II, 13, I, first branched ray 1 4/5 to 2 1/8 in head from snout tip; A. III, 12, I or III, 13, I, first branched ray 2 to 2 3/5; least depth of caudal peduncle 3 3/5 to 4 1/8; caudal 1 1/5; pectoral 1 2/5 to 1 2/3; ventral 2 1/5 to 2¼, insertion of fin midway between front nostril and caudal base.

Back and upper surface of head brown, each scale pocket dark brown, showing through scales as brown marginal crescent. On predorsal 3 median, parallel, close set dark lines. Beak dark neutral gray to dusky. Iris silvery white. Narrow silvery white axial band, much less than pupil depth and bordered above, expecially posteriorly by blue gray still narrower band or line. Fins pale to whitish, dorsal and caudal darker to dusky terminally.

India, Ceylon, Malaya, East Indies, Philippines, China, Nicronesia, New South Wales?

9121 to 9129. Catbalogan, Samar. April 15, 1908. Length 138 to 190 mm.

22319. Cebu. March 13, 1909. Length 167 mm.

15 examples. Jolo, Jolo Island, February 7, 1908. Length 60 to 90 mm.

20427. Malampaya River, Palawan. December 26, 1908. Length 38 to 185 mm. 3 examples.

2 examples. Manila Bay, Luzon. December 6, 1907. Length 108 to 124 mm.

5 examples. Manila Bay. December 8, 1907. Length 95 to 103 mm.

1 example. Manila Bay. December 9, 1907. Length 100 mm.

6 examples. Manila market. March 16, 1908. Length 65 to 186 mm.

20648. Manila market. June 13, 1908. Length 123 mm.

6394. Mantaquin Bay, Palawan. April 1, 1909. Length 65 to 110 mm. 2 examples.

22175. Port Bais, Negros. March 31, 1908. Length 124 mm.

19457, 19460, 19461, 19511. Ragay Bay, Ragay, Luzon. March 10, 1909. Length 155 to 197 mm.

2 examples. San Roque. July 28, 1908. Length 88 ? to 95 mm.

17554. Sorsogon market. March 12, 1909. Length 158 mm.

20554. Tilig, Lubang Island. June 14, 1908. Length 88 mm.

8 examples. Sandakan anchorage. March 1, 1908. Length 160 to 200 mm.

24394. Sandakan Bay, Borneo. March 2, 1908. Length 81 to 140 mm. 6 examples.

5288 to 5306. Sandakan Bay. March 21, 1908. Length 129 to 218 mm. 23 examples.

A. N. S. P., nos. 48843 to 48852. Philippines. Commercial Museum of Philadelphia. Length 95 to 120 mm. As Dermatogenys viviparus.

A. N. S. P., nos. 48946 to 48962. Philippines. Commercial Museum of Philadelphia. Length 125 to 135 mm.

Hyporhamphus melanurus (Valenciennes)

Hemiramphus melanurus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 42, 1846 (type locality: Celebes). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 2, p. 472, 1851 (Rio); vol. 3, p. 747, 1852 (Celebes); Verh. Batav. Genoot. (Snoek, Vissch.), vol. 24, p. 19, 1852 (Batavia); Nat. Tijds. Nederland, Indië, vol. 11, p. 419, 1856 (Muntok, Banka); vol. 13, p. 385, 1857 (Batjan); vol. 20, pp. 238, 450, 1859-60 (Singapore). --KNER, Reise Novara, Fische, p. 324, 1865 (Madras). --STEINDACHNER, Sitzs. Ber. Akad. Wiss. Wien, Math. nat. Kl., vol. 60, pt. 1, p. 571, 1870 (Singapore). --JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, p. 176, 1909 (Takao, Formosa). --WEBER, Siboga Exp., Fische, vol. 57, p. 130, 1913 (Menado, Celebes; Liring, Salibabu).

Hemirhamphus melanurus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 156, 1866 (Java, Singapore, Bintang, Banka, Celebes, Batjan). --GUNTHER Cat. Fishes Brit. Mus., vol. 6, p. 264, 1866 (Hong Kong). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 58, pl. ( ) 253, fig. 6, 1866-72 (localities above); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 294, 1868 (Rio, Bintang). --KÁROLI, Termesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (Singapore). --ELERA, Cat. Fauna Filip., vol. 1, p. 75, 1895 (Luzon, Cavite, Santa Cruz). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 151, 1922 (Atjeh, Sumatra; Batavia and Semarang, Java; Menado, Celebes; Salibabu).

Hemirhamphus guntheri BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 59, 1866-72 (on Günther 1866)

Hyporhamphus guntheri FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 267, Dec. 1932 (compiled).

Depth 9 3/4 to 10, body little compressed, robust, sides flattened; head 2 9/10 to 3 1/10, head from snout tip 4 3/4 to 5, width 2 4/5 in its length, 4 4/5 to 5 1/5 in its length from mandible tip. Snout 2 4/5 to 3 in head from snout tip; eye 3 2/3 to 4 1/5, 1 1/3 to 1 2/5 in snout, greater to subequal with interorbital, 1 3/5 to 1 2/3 in postocular; maxillary reaches 3/4 to eye, length 3 2/3 to 3 3/4 in head from snout tip; interorbital 4¼ to 4 1/3, level. Gill rakers 6 + 19, slender, ½ of gill filaments, which 1 3/4 in eye.

Scales 53 or 54 in median axial row to caudal base and 4 or 5 more on latter; 6 above lateral line; 42 or 43 predorsal to front of snout, of which 32 or 33 forward to gill opening. Few scales along front of dorsal and anal. Scales with 2 short close set marginal basal striae; circuli 17 to 21 fine parallel basal striae, not extended apically.

D. II, 13 or II, 14, first branched ray 2 to 2 1/10 in head from snout tip; A. II, 14 or II, 15, first branched ray 2¼ to 2 3/5; least depth of caudal peduncle 4 to 4 1/10, well compressed; pectoral 1 2/5 to 1 2/3; ventral 2 2/5, origin midway between front nostril and caudal base; caudal 1 4/5 to 1 7/8 in total head length.

Light brown on back and upper surfaces. Down middle of back before dorsal 3 parallel, cose set, dark lines. Lower surfaces of body white, with silvery tints. Bright silvery white axial lateral band, narrower than eye and most distinct posteriorly, also bordered above by dark leaden line. Iris silvery white. Beak blackish. Fins dull brown, lower ones lighter and dorsal and caudal tips contrasted blackish.

Malaya, East Indies, China, Formosa. The two examples listed below differ a little from Bleeker's colored figure, as he shows both the dorsal and anal fin membranes entirely scaly. Bleeker's figure also shows far more scales in a lateral axial series, or 65 counted from gill opening and 60 counted in the lateral line. His description says "squamis lateribus 50 circiter in series longitudinali". He then takes into consideration Günther's Chinese fish, supposed to differ in having 58 scales and baptizes it guntheri! Weber and Beaufort also seem to think guntheri valid and give the lateral line 55 for melanurus. The present species, as Bleeker contends, is best known by its more advanced ventral and black tipped dorsal and caudal.

2 examples. Sandakan, Borneo. March 1, 1908. Length 215 to 217 mm.

Hyporhamphus regularis (Günther)

Hemirhamphus regularis GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 261, 1866 (type locality: Australia; Western Australia). --CASTELNAU, Proc. Linn. Soc. New South Wales, vol. 3, p. (355) 394, 1878 (Port Jackson). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 181, 1881 (Port Jackson). --STEAD, Fishes of Australia, p. 64, 1907 (New South Wales, Victoria); Ed. Fishes New South Wales, p. 37, pl. 11, 1908. ROUGHLEY, Fishes of Australia; p. 29 (not pl. 5), 1916 (Western Australia; not New South Wales and Queensland). --MC CULLOCH, Fishes New South Wales, ed. 2, p. 31, 1927 (part).

Hyporhamphus regularis OGILBY, Handbook of Sydney, p. 123, 1898. --MC CULLOCH, Mem. Austral. Mus., no. 5, pt. 1, p. 102, June 29, 1929 (New South Wales, Queensland, Western Australia).

Reporhamphus regularis WHITLEY, Australian Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931 (reference).

Head over 3. Triangular part of upper jaw formed by premaxillaries much broader than long; eye 1½ in postorbital, rather less than interorbital; beak measured before snout tip 2 in rest of head; vertex and interorbital space canex.

Scales 58 in lateral series. Dorsal and anal scaleless.

D. 15; A. 17, little shorter though opposite dorsal; caudal moderately forked, lobes nearly equal and central rays much longer than eye; pectoral rays 12; ventral base nearly midway between front eye edge and caudal base.

Sides with well defined silvery band as wide as a scale. Length 230 mm. (Günther.)

Western Australia, Victoria, New South Wales, Queensland.

Hyporhamphus sinensis (Günther)

Hemirhamphus sinensis GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 265, 1866 (type locality: China). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference). --ELERA, Cat. Fauna Filip., vol. 1, p. 575, 1895 (Luzon, Manila, Navotas).

Hyporhamphus sinensis RUTTER, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 69 (Swatow). --FOWLER and BEAN, Proc. U.S.Nat. Mus., vol. 58, p. 314, 1920 (Soochow). --NICHOLS, Bull. Amer. Mus. Nat. Hist., New York, vol. 58, art. 1, p. 49, Oct. 15, 1928 (Tungting Lake, Hinan). --FOWLER, Hong Kong Naturalist, vol. 3,4, p. 266, Dec. 1932 (Soochow material).

Depth 16 1/3, body robust, scarcely compressed, sides convex; head 2 3/4, head from snout tip 4 3/4, width 3 3/4, width 8 3/4 in head from mandible tip. Snout 2 2/5 in head from snout tip; eye 4½, 1 4/5 in snout, subequal with interorbital; maxillary reaches 5/6 of snout, length 1 1/6 in head from snout tip; interorbital 4½, low, level. Gill rakers 8 + 20, lanceolate, 3/4 of gill filaments, latter 1 2/5 in eye.

Scales (pockets) 48? in axial series from gill opening and caudal base; 8 scales above lateral line to dorsal origin; 37 predorsal to occiput. Dorsal and anal scaleless. Scales with 3 or 4 basal radiating striae; coarse circuli 14.

D. II, 14, first branched ray 3 in head from snout tip; A. II, 16, first branched ray 2 5/6; caudal 1½, little emarginate behind and lower lobe slightly longer; least depth of caudal peduncle 7 3/4, compressed; pectoral 1½; ventral 2½, inserted midway between gill opening and caudal base.

Pale clay color generally, more or less uniform. Sides of head, especially opercle, iris and broad longitudinal band nearly equal to eye in width, extends from shoulder to caudal base medially, bright silvery white. Beak pale brown. Fins uniform pale brown.

China. Reported from the Philippines by Elera.

U. S. N. M., no. 83995. Soochow, China. N. Gist Gee. Length 155 mm.

Hyporhamphus sindensis (Regan)

Hemirhamphus sindensis REGAN, Journ. Bombay Nat. Hist. Soc., vol. 16, no. 2, p. 318, 1905 (type locality: Karachi).

Depth 9½, 1 2/5 in body width; head 2 3/5. Snout long as broad; eye 1 1/3 in postorbital, nearly equals interorbital; beak before snout little longer than rest of head.

Scales 50 to 55 in longitudinal series, deciduous. Dorsal and anal scaly.

D. 14; A. 15, begins nearly opposite dorsal; caudal forked; pectoral equals space from hind opercle edge to front pupil edge; ventral origin midway between front opercle edge and caudal base.

Silvery white stripe on side, broader posteriorly. Length 188 mm. to caudal base. (Regan.)

Karachi.

Hyporhamphus xanthopterus (Valenciennes)

Hemirhamphus xanthopterus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 47, 1846 (type locality: Fresh waters of Alipey). --DAY, Fishes of India, pt. 3, p. 514, pl. 119, fig. 2, 1877; Fauna Brit. India, Fishes, vol. 1, p. 425, 1889. --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 162, 1922 (Kner's materials).

Hemiramphus xanthopterus DAY, Fishes of Malabar, p. 168, 1865; Proc. Zool. Soc. London, 1865, p. 309 (Cochin, Malabar). --STEINDACHNER, Denks. Akad. Wiss. Wien, Math.-nat. Kl., vol. 71, pt. 1, p. 155, 1907 (Scheich Othman).

Hemiramphus erythrorhynchus (not LE SUEUR) KNER, Reise Novara, Fische, p. 324, 1865 (Ceylon).

Depth 9 2/3; head 2 7/8. Snout 2 4/5 in head from snout tip, longer than wide at base; eye 4, 1½ in snout, 1 to 1 1/3 in interorbital; teeth in many rows, tricuspidate; mandible before snout tip 1 1/3 in rest of head; interorbital very low.

Scales 56 to 58 in median lateral series; 7 above. Dorsal and anal scaleless except few small scales on anterior portion.

D. II, 13, first branched ray 2 1/5 in head from snout tip; A. II, 14, first branched ray 2 1/5; caudal 1 1/8, forked, upper lobe 1¼ in lower; pectoral I, 12, fin 1 3/5 in head from snout tip; ventral I, 5, fin 2 4/5, origin midway between hind eye edge and caudal base.

Brilliant lateral band, 2/3 wide as scale in its widest part. End of beak coral red. (Day.)

Arabia, India, Ceylon. Valenciennes gives the length as 150 mm.

Hyporhamphus ardelio (Whitley)

Reporhamphus ardelio WHITLEY, Australian Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931 (on Stead).

Hemirhamphus regularis (not GUNTHER) CASTELNAU, Proc. Linn. Soc. New South Wales, vol. 3, p. 394, 1879 (type locality: Port Jackson). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, p. 245, 1881 (Port Jackson). --WOODS, Fisher. New S. Wales, p. 84, pl. 37, lower fig., pl. 38, 1883. --OGILBY, Edible Fish. New South Wales, p. 174, pl. 43, 1893. --STEAD, Edible Fish. New South Wales, p. 37, pl. 11, 1908 (fish markets New South Wales). --ROUGHLY, Fishes of Australia, p. 29, pl. 5, 1916 (New South Wales; South Queensland; part) --MC CULLOCH, Fishes of New South Wales, ed. 2, p. 31, 1927.

Depth 9 3/4; head 3 1/8. Snout 3 in head from snout tip; eye 3 7/8, 1 1/5 in snout; maxillary reaches about 2/3 ? to eye, length 3 2/5 in head from snout tip; interorbital very low.

Scales moderately large (not given).

Dorsal (rays not given) fin height 4½ in total head length; anal like dorsal, opposite, fin height 4 1/5; caudal 2, moderately forked, broad lobes pointed, upper 1 1/8 in lower; least depth of caudal peduncle 1 1/5 times eye; pectoral 2 3/4 in total head length; ventral 4 7/8, origin midway between front of eye and caudal base.

Back pale green. Upper surface of head darker, with golden reflections. Three narrow black vertebral streaks, not extending so far back as dorsal. Two similar but irregular and broader streaks between these and broad silvery lateral band, which bordered above by narrow orange streak. Faint black spot at pectoral base. Length 330 mm. (Stead.)

New South Wales, in coastal lakes, harbors and estuaries, sometimes also to fresh water.

Hyporhamphus quoyi (Valenciennes)

Hemiramphus quoyi VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. , 1846 (type locality: Port Dorey, New Guinea). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 2, p. (472) 491, 1851 (Rio; Batavia); vol. 3, pp. 54, 59 (Singapore), p. 249 (New Guinea), p. 546 (Amboina), p. 717 (Banka), p. 718 (Koba); Verh. Batav. Genoot. (Snoek. Vissch.), vol. 24, p. 26, 1852 (Batavia; Rio); Nat. Tijds. Nederland Indië, vol. 6, p. 518, 1854 (Oelakan, west Sumatra); vol. 7, p. 314, 1854 (Bantem); vol. 8, p. 437, 1855 (Bonthaian, Celebes); vol. 10, p. 348, 1856 (Rio, Bintang); vol. 12, p. 217, 1856 (Nias); Act. Soc. Sci. Ind. Néerland, no. 9, vol. 3, p. 4, 1857-58 (Trussan, Sumatra), p. 6, (Siboga); no. 2, vol. 6, p. 5, 1859 (Port Dorey); (Sumatra 9), vol. 8, p. 2, 1860 (Benculen); Nat. Tijds. Nederland Indië, vol. 22, p. 65, 1860 (Benculen).

KNER, Reise Novara, Fische, p. 323, 1865 (Singapore). --ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, p. 350, 1876 (Hall Sound, New Guinea). --MARTENS, Preuss. Exp. Ost-Asien, vol. 1, pp. 325, 406, 1876 (Manila). --WEBER, Zool. Ergebn. Reise Nederland Ost Indië, vol. 3, p. 456, 1894 (Singapore, Borneo, Banka, Sumatra, Nias, Java, Celebes, Amboina).--JORDAN and SEALE, Bull. Bur. Fisher.,vol. 26, p. 8, 1906 (1907) (Cavite). --EVERMANN and SEALE, Bull Bur. Fisher., vol. 26, p. 58, 1906 (1907) (Bacon). --WEBER, Siboga Exp., Fische, vol. 57, p. 129, 1913 (Labuan Tring, Lombok and Buka-Bai, Rotti). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 8 (Philippines); Copeia, no. 58, p. 62, June 18, 1918 (Philippines). Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 262 (Vigan, Orani, Philippines); Mem. Bishop Mus., vol. 10, p. 77, 1928 (New Guinea).

--WHITLEY, Rec. Australian Mus., vol. 16, no. 4, p. 214, March 28, 1928 (Port Darwin, Gulf of Carpentaria, Queensland). --MC CULLOCH, Australian Mus. Mem., no. 5, pt. 1, p. 102, June 29, 1929 (Queensland, North Australia, New Guinea).

Hemiramphus quoyi BLEEKER, Nat. Tijds. Nederland Indië, vol. 3, p. 54, 1852. (Singapore).

Hemirhamphus quoyi BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 153, 1866 (Java, Sumatra, Nias, Singapore, Bintang, Banka, Borneo, Celebes, Amboina, New Guinea). --GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 267, 1866 (East Indies). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 323, pl. ( ) 323, fig. 1, 1866-72 (above localities); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 294 1868 (Rio, Bintang); ser. 2, vol. 7, p. 36, 1873 (Aru). --GUNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, p. 50, 1880 (Somerset, Queensland). --KÁROLI, Termesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (Singapore, Matang). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 183, 1881 (South New Guinea); vol. 7, p. 593, 1882

(New Guinea). --ELERA, Cat. Fauna Filip., vol. 1, p. 575, 1895 (Luzon, Batangas, Nasugbu). --VOLZ, Nat. Tijds. Nederland Indië, vol. 46, p. 178, 1907 (Siboga, Ulakan, Padang, Trussan, Benkulen). --WEBER, Nova Guinea, vol. 5, pt. 2, p. 229, 1908 (Etna Bay, south west New Guinea); --BEAUFROT, Bijd. Dierk., Amsterdam, pt. 19, p. 104, 1913 (Beo, Waigiu). --WEBER and BEAUFORT, Fishes Indo Austral Archipelago, vol. 4, p. 154, 1922 (Java, Madura, Lombok, Flores, Rotti, Celebes, Buton, Ambon, Halmaheira, Waigiu, New Guinea). --MC CULLOCH and WHITLEY, Mem. Queensland Mus., vol. 8, no. 2, p. 138, 1925 ( ). --PARADICE and WHITLEY, Mem. Queensland Mus., vol. 9, no. 1, p. 80, pl. 11, fig. 2, 1927.

Belone quoyi KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, Math. nat. Kl., vol. 80, pt. 1, p. 415, 1879 (Port Darwin; Endeavour River).

Hyporhamphus quoyi EVERMANN and SEALE, Proc. U. S. Nat. Mus., vol. 31, p. 506, 1906 (Manila).

Depth 9 2/5 to 10, body robust and cylindrical; head from mandible tip 2 3/4 to 2 7/8, from snout tip 4 1/5 to 4 3/4, width 2½ to 2 3/5. Snout 2 2/3 to 2 4/5 in head; eye 3 3/5 to 3 4/5, 1 1/5 to 1 2/5 in snout, 1 1/8 to 1¼ in interorbital, 1 1/5 to 1½ in postocular; maxillary reaches 3/5 to 3/4 to eye, length 3 2/5 to 4 in head from snout tip; mandible before snout tip 6¼ to 7 in total length; interorbital 3½ to 3 2/3, nearly level or with slight median depression. Gill rakers 11 + 23, lanceolate, 1 1/8 in gill filaments, which 2 ¼ in eye.

Scales 50 to 57 in axial lateral series to caudal base and 5 or 6 more on latter; 7 above; 44 or 45 predorsal, of which 30 or 31 forward to occiput. Dorsal and anal largely covered with fine, crowded, close set, small scales. Scales with 1 to 3 basal radiating striae; circuli as parallel vertical striae, 32 to 61 basal, 93 to 125 terminal.

D. II, 13 or II, 14, first branched ray 2 3/4 in head from snout tip; A. II, 12 or II, 13, first branched ray 3¼ to 3½; caudal 1 1/8 to 1 1/5, well forked, lower lobe much longer; least depth of caudal peduncle 4 1/3 to 4 2/5; pectoral 1 2/3 to 1 3/4; ventral 2 4/5 to 3, inserted nearer caudal base than gill opening, reach 1 4/5 to vent.

Back and upper surface of head brown, sides and lower surfaces silvery white. Scales caducous, each one on back with dark or dusky pocket, forming blackish network. Median dark line down back. Bright silvery white lateral axial band, dividing color of back and lower surfaces. Iris silvery white. Fins all pale brownish, lower ones paler or more whitish.

Malaya, East Indies, Philippines, North Australia, Queensland.

5 examples. Abuyog. July 26, 1909. Length 190 to 225 mm.

21093, 21094. Atulayan Bay. June 17, 1909. Length 50 to 188 mm. 4 examples.

6779 to 6781. Bolinao Bay. May 10, 1909. Length 114 to 155 mm.

5680. Busin Harbor, Burias Island. April 23, 1908. Length 210 mm.

22972 to 22978, 22980 to 22982. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length 255 to 300 mm.

16708. Capunuypugan, Mindanao. May 9, 1908. Length 94 to 202 mm. 17 examples.

1 example. Cataingan Bay. April 18, 1908. Length 53 mm.

9088, 9089, 20453, 20454. Catbalogan anchorage, Samar. April 15, 1908. Length 100 to 248 mm. 11 examples.

5960 [738]. Cavite market. December 1, 1908. Length 213 mm.

18371. Cavite. May 14, 1909. Length 215 mm.

5351. Cebu. April 4, 1908. Length 310 mm.

6 examples. Cuyo Island. April 9, 1909. Length 38? to 67 mm.

19889 to 19891. Daisy Island, west of Bumbum. January 6, 1910. Length 214 to 235 mm.

9167 to 9170. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length 176 to 234 mm. 14 examples.

11805. Guijulugan, Negros. April 2, 1908. Length 47? to 191 mm. 3 examples.

1 example. Guiniyan Island. June 4, 1909. Length 90? mm.

20599, 20600. Leugaysu Gulf. May 11, 1909. Length 132 to 170 mm.

5 examples. Luzon shore San Vicente Harbor. November 13, 1908. Length 135 to 193 mm.

9 examples. Malcochin Harbor, Linacapan Island. December 18, 1908. Length 63 to 228 mm.

2 examples. Malcochin Harbor. December 1908. Length 217 to 225 mm.

17930. Manila market. June 13, 1908. Length 232 mm, without beak.

1 example. Mansalay, Mindoro. June 3, 1908. Length 47 mm.

6132, 10776, 11776, 20860. Mansalay. June 4, 1908. Length 65 to 278 mm. 6 examples.

6389 to 6393. Mantoquin Bay, Palawan. April 1, 1909. Length 90? to 275 mm. 6 examples.

6207. Mantaquin Bay. April 2, 1909. Length 212 mm.

5575. Masbate Bay, Masbate. April 20, 1908. Length 186? mm.

6 examples. Mati, Pujada Bay, Mindiao. May 13, 1908. Length 76 to 166 mm.

5791. Mati. May 15, 1908. Length 119 to 228 mm. 8 examples.

13885. Matnog Bay. May 31, 1909. Length 64 to 183 mm. 14 examples.

14080. Mompog Island, Anabayas Islands. March 3, 1909. Length 120 mm.

1 example. Nato River. June 17, 1909. Length 72 mm.

1 example. Nogas Point, Panay. February 4, 1908. Length 76 mm.

17 examples. North end of Endeavour Strait, north west coast of Palawan. December 22, 1908. Length 174 to 223 mm.

13132. Palloc, Mindanao. May 22, 1908. Length 200 mm.

1 example. Paluan Bay, Mindoro. December 11, 1908. Length 92 mm.

19736, 19737, 19738. Panabutan, Mindanao. February 5, 1908. Length 108 to 138 mm.

1 example. Panabutan Bay. February 6, 1908. Length 82 mm.

22243 to 22247. Pandanon Island. March 23, 1909. Length 205 to 222 mm.

18 examples. Pangauron River, Port Caltom, Busuanga Island. December 16, 1908. Length 85 to 244 mm.

21 examples. Parang, Parang, Mindanao. May 23, 1908. Length 72? to 237 mm.

1 example. Philippines. Length 118 mm.

3 examples. Port Caltom, Busuanga Island. December 15, 1908. Length 70? to 94 mm.

18711. Port Dupon, Leyte. March 17, 1909. Length 40 to 169 mm. 2 examples.

17177. Port Matalvi, Malapascua Island. November 23, 1908. Length 196 mm.

19626. Port Palapag. June 3, 1909. Length 129 mm.

14611. Port Palapag. June 14, 1909. Length 163 mm.

13 examples. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length 152 to 194 mm.

6572, 6573. Port San Vicente. November 18, 1908. Length 48 to 334 mm. 10 examples.

4 examples. Port Uson, west of Pinar Island. December 17, 1908. Length 196 to 218 mm.

18743 to 18745. Pratas Reef. October 25, 1908. Length 181 to 240 mm. 18 examples.

2 examples. Ragay Bay, Ragay Gulf, Luzon. March 10, 1909. Length 43 to 46 mm.

6296. Romblon Harbor. March 25, 1908. Length 205 mm.

21307, 21308. Romblon. March 26, 1908. Length 118 to 148 mm.

12262. San Juanico Light, Samar. April 13, 1908. Length 218 mm.

1 example. San Miguel Harbor, Ticao Island. April 2, 1908. Length 105 mm.

20237. San Miguel Harbor. April 21, 1908. Length 85 to 185 mm. 2 examples.

6318. San Roque market. June 27, 1908. Length 254 mm.

5694, 19670. Santa Cruz Island, Marinduque. April 24, 1908. Length 163 to 305 mm.

1 example. Santa Maria, Siquijor Island. August 11, 1909. Length 30? mm.

2 examples. Santiago River, Pagapas Bay, Luzon. February 20, 1909. Length 178 to 186 mm.

20613. Sirinao Island, Nakoda Bay near Alfonso XIII. December 30, 1908. Length 204 mm.

17313. Sipadan Island. September 28, 1909. Length 200 mm.

19430. Sorsogon market. March 12, 1909. Length 145 mm.

4 examples. Subig Bay, Olongapo market. Janurary 7, 1908. Length 178 to 197 mm.

8387, 8388. Surigao, Mindanao. May 8, 1908. Length 39 to 235 mm. 4 examples.

1 example. Tataan Pass, Sulu Archipelago. February 20, 1908. Length 44 mm.

D. 5561. Teomabal Island (N.W.), S. 36° W., 0. 2 mile (lat. 5°50´45"N., long. 121°01´15"E.), Jolo Island and vicinity. September 18, 1909. Length 37 to 98 mm. 37 examples.

1 example. Tilig, Lubang. July 14, 1908. Length 50? mm.

7811 to 7817, 7846. Ulugan Bay near Baheli River mouth, Palawan. December 28, 1908. Length 113 to 222 mm. 9 examples.

5135. Usada Island, near Jolo. March 5, 1908. Length 302 mm.

9152, 19096. Varadero Bay, Luzon. July 23, 1908. Length 58? to 200 mm. 3 examples.

2 examples. Varadero Bay. July 25, 1908. Length 53 to 70? mm.

2 examples. Varadero Harbor. July 22, 1908. Length 77 to 182 mm.

17204. Verde del Sur, Palawan. April 6, 1909. Length 150? mm.

7 examples. Great Tobea Island. December 15, 1909. Length 163 to 210 mm.

D. 5669. Mamuju Island (E.), S. 14°E., 18.5 miles (lat. 2°19´30"S., 118°50´E.), Macarsar Strait, Celebes. December 29, 1909. Length 36 mm.

1 example. Sandakan, Borneo. February 29, 1908.

Length 68? mm.

22641. Talissi Island. November 9, 1909. Length

125 mm.

18265, 18266. Tomahu Island. December 11, 1909.

Length 212 to 219 mm.

A. N. S. P., nos. 47570 to 47574. Philippine Islands.

Commercial Museum of Philadelphia. Length 198 to

253? mm.

A. N. S. P., one example. Orani, Botaan Province,

Luzon. April 28, 1923. Rev. Joseph Clemens. Purchased.

Length 247 mm.

Hyporhamphus balinensis (Bleeker)

Hemirhamphus balinensis BLEEKER, Nat. Tijds. Nederland Indië, vol. 16, p. 266, 1858 (type locality: Bali); vol. 17, p. (143) 170, 1858-59 (Boleling, Bali). --GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 261, 1866 (type). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 58, pl. ( ) 252, fig. 4, 1866-72 (Bali). --WAITE, Mem. Australian Mus., no. 3, p. 195, 1897 (Funafuti, Ellice Islands). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 152, 1922 (Sumba, Flores, Kajoa, between Gebe and Fau, Ceram, Binongka, Tiur).

Hemiramphus balinensis WEBER, Siboga Exp. Fische, vol. 57, p. 130, 1913 (Kajoa Island between Gebe and Fau, Kawa, Binongka, Tiur). --WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 152, 1922 (Sumba; Flores; Kajoa; also Weber's material). --FOWLER, Mem. Bishop Mus., vol. 10, p. 76, 1928 (compiled); vol. 11, no. 5, p. 319, 1931 (compiled).

Hemirhamphus intermedius (not CANTOR) BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 154, 1866 (Bali; not synonymy). --SCHMELTZ, Cat. Mus. Godeffroy, no. 4, p. 25, 1869 (Samoa); no. 7, p. 57, 1879 (Samoa). --POHL, Cat. Mus. Godeffroy, no. 9, p. 38, 1884 (Samoa).

Hemirhamphus balinensis var. occidentalis

WEBER and BEAUFORT , Fishes Indo Austral. Archipelago, vol. 4, p. 152, 1922 (type locality: Pulu Babi, west coast of Sumatra).

Depth 10 2/3 to 18, body rather robust, compressed, sides flattened; head 2½ to 2 2/3, head from snout tip 4¼ to 4 3/4, width 3 to 3 2/5, width 5 3/4 to 9¼ in head from mandible tip. Shout 2 2/3 to 2 4/5 in head from snout tip; eye 4 1/3 to 4 3/5, 1½ to 1 4/5 in snout, 1½ to 1 4/5 in postocular, 1 1/5 to 1¼ in interorbital or little greater than bony interorbital; maxillary 3/5 to 2/3 to eye, length 3 2/3 to 3 3/4 in head from snout tip; mandible before snout tip 4 1/8 to 4 2/3 in total head length; bony interorbital 4 to 4 3/4, level, with wide median shallow concavity. Gill rakers 8 + 25, slender, 1 2/3 in gill filaments which 1 4/5 in eye.

Scales 51 to 53 in lateral axial series to caudal base and 4 or 5 more on latter; 7 above; 50 to 54 predorsal, of which 34 or 35 forward to gill opening. Dorsal and anal finely scaled. Scales with 25 to 63 parallel vertical striae, incomplete over median vertical axis.

D. II, 13 to II, 15, first branched ray 3 to 3¼ in head from snout tip; A. II, 15 or II, 16, first branched ray 3 1/10 to 3½; least depth of caudal peduncle 5 7/8 to 6; pectoral 2 1/10 to 2 1/5; ventral 3½ to 3 3/4, origin about midway between gill opening and caudal base.

Beak and upper surfaces brown, scale pockets darker and show through each scale as submarginal dark crescentic blotch. Predorsal part of back with 3 close and dark parallel lines. Sides and under surfaces of body white with silvery reflections. Silvery white axial band on side, not quite wide as eye depth and bounded its whole course above with dark gray narrow band. Beak dusky to blackish. Iris silvery white. Dorsal and caudal grayish, other fins pale to shitish.

East Indies, Philippines, Polynesia. Known chiefly by its long preorbital, which long as eye. The scales are very caducous, all of my specimens nearly entirely denuded.

14 examples. Camp Overton, Mindanao. August 5, 1909. Length 136 to 213 mm.

9 examples. Jolo, Jolo Island. February 8, 1908. Length 40 to 87 mm.

16138. Mahinog anchorage, Camiguin Island. August 3, 1909. Length 190 mm.

10 examples. Nogas Point, Panay. February 1908. Length 163 to 218 mm.

6 examples. Sablayan Bay, Mindoro. December 12, 1908. Length 87 to 119 mm.

17314. Sipadan Island. September 28, 1909. Length 188 mm.

22578, 22579. Tataan Pass. February 20, 1908. Length 156 to 165 mm.

20868. Tumindao Island anchorage. February 25, 1908. Length 215 mm.

1 example. Varadero Bay. July 22, 1908. Length 78 mm.

22 examples. Limbe Strait, Celebes. November 9, 1909. Length 60 to 101 mm.

1 example. Sandakan anchorage, Borneo. March 1, 1908. Length 100 mm.

Hyporhamphus pacificus (Steindachner)

Hemirhamphus pacificus STEINDACHNER, Denks. Akad. Wiss. Wien, Math. nat. Kl., vol. 70, p. 511, 1901 (type locality: Laysan Island). --SEALE, Occas. Pap. Bishop Mus., vol. 1, no. 5, p. 15, 1902 (Hilo). --GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 356, 1909 (Hawaiian Islands).

Hemiramphus pacificus JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 207, 1905 (1906) (Pago Pago). --? SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 494, 1912 (Okinawa, Riu Kiu).-- FOWLER, Mem. Bishop Mus., vol. 10, p. 75, 1928 (Honolulu, Laysan, Waikiki, Samoa); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (Nukuhiva, Marquesas).

Hyporhamphus pacificus SNYDER, Bull. U.S. Fish. Comm., vol. 22, p. 522, 1902 (1903) (Laysan Island). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 126, fig. 41, 1903 (1905)(Kailua). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 6 (Hawaiian Islands). --FOWLER and SILVESTER, Marine Pap. Carnegie Inst., p. 114, 1922 (Pago Pago; Hawaii). --FOWLER, Copeia, no. 122,p. 82, Nov. 20, 1922 (Hawaii).

Hyporamphus pacificus BORODIN, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 46, 1930 (Mindinao; error).

Hemiramphus affinis (not GUNTHER) JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 207, 1905 (1906) (Apia specimen).

Depth 12 to 12½, body robust, but slightly compressed; sides little flattened; head 2 2/3 to 2 3/4, head from snout tip 4½ to 4 3/5, width 3¼ to 3 1/3. Snout 2 3/5 to 2 2/3 in head from snout tip; eye 3 1/3 to 4 1/5, 1½ to 1 3/5 in snout, subequal or slightly greater than interorbital; maxillary reaches 3/5 to eye, length 3½ to 3 4/5 in head from snout tip; interorbital 4 3/4 to 4 4/5, level. Gill rakers 10 + 23 or 24, lanceolate, 1½ in gill filaments, which 1 3/4 in eye.

Scales 65 to 67 in medial axial count from gill opening to caudal base and 5 or 6 more on latter; 7 above, 2 below, 39 or 40 predorsal forward to occiput. Dorsal and anal largely covered with small scales, also caudal base. Scales with fine vertical striae, basal 19 or 20, variously or not complete in vertical axis of scale.

D. III, 14, first branched ray 5 3/5? to 5 3/4 in total head length; A. III, 15 or III, 16, first branched ray 6½? to 7; caudal (damaged) forked, lower lobe longer, 2 3/5?; least depth of caudal peduncle 12¼; pectoral 4 2/3 to 4 3/5; ventral 6 1/3 to 6½, inserted midway between gill opening and caudal base.

Back umber or brown, sides paler, apparently whitish in life. Fallen scales of back expose dark pockets, made up of blackish dots. From upper part of pectoral axil narrow silvery white band, widest between dorsal and anal where width ½ vertical eye diameter, and along upper edge narrow leaden bordering line. Iris bright silvery white. Fins pale brown, dorsal and caudal terminally and upper pectoral edge grayish.

Philippines, Polynesia, Hawaii.

A. N. S. P., nos. 28121 to 28124. Hawaiian Islands. U.S. Fish Comm. Length 127 to 138 mm.

A. N. S. P., no. 31032. Apia, Samoa. Bureau of Fisheries. Length 180 mm, beak and caudal broken. As Hemiramphus affinis.

A. N. S. P., no. 51527. Pago Pago, Samoa. Capt. C. F. Silvester. Length 205 mm.

Hyporhamphus acutus (Günther)

Hemirhamphus acutus GUNTHER, Proc. Zool. Soc. London, 1871, p. 671 (type locality: Paratonga, Cook Islands); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 356, 1909 (type).

Hemiramphus acutus FOWLER, Mem. Bishop Mus., vol. 10, p. 75, 1928 (copied)

Head over 3 to caudal base. Beak before snout tip little over 2 in head; triangular upper jaw rather longer than broad; eye 1 2/3 in postorbital, little less than interorbital; vertex and interorbital flat. Scales 53; dorsal and anal scaleless. D. 13; A. 17, begins little before dorsal, but fins nearly subequal in length; caudal forked, lower lobe longer, central rays longer than eye; ventral base midway between caudal base and gill opening. Sides with well defined silvery stripe. Length 152 mm.

(Günther.)

Polynesia.

Hyporhamphus sayori (Schlegel)

Hemiramphus sayori SCHLEGEL, Fauna Japonica,

Poiss., pts. 10 to 14, p. 246, pl. 110, fig.

2, 1846 (type locality: Interior of Nagasaki

Bay).

Hemiramphus sajori BLEEKER, Verh. Batav. Genoot.

(Nal. Japan), vol. 26, pp. 5, 116, 1857

(Nagasaki); Act. Soc. Sci. Ind. Néerland,

no. 3, vol. 3, p. 3 (Kioesio), p. 6 (Japan),

1857-58. --MARTENS, Preuss. Exp. Ost-Asien,

vol. 1, pp. 126, 401, 1876 (Yeddo, Yokohama,

Nagasaki). --JORDAN and STARKS, Proc. U. S.

Nat. Mus., vol. 31, p. 516, 1906 (Port Arthur).

--EVERMANN and SHAW, Proc. Calif. Acad. Sci.,

vol. 16, no. 4, p. 112, 1927 (Chefoo). --

TCHANG, Contrib. Biol. Lab. Sci. Soc. China,

vol. 4, no. 4, p. 32, fig. 37, 1928

(Nanking).

Hemiramphus sajorii BLEEKER, Verh. Batav. Genoot. (Japan), vol. 25, p. 18, 1853 (Sajori).

Hemirhamphus sajori GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 265, 1866 (copied); Rep. Voy. Challenger, vol. 1, pt. 6, p. 70, 1880 (Yokohama). --KÁROLI, Termesz. Füzeted, Budapest, vol. 5, p. 182, 1881 (Kobe, Yokohama). --STEINDACHNER, Denks. Akad. Wiss. Wien Math.-nat. Kl., vol. 49, pt. 1, p. 294, 1885 (Tokyo). --ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, p. 18, 1897 (reference). --SOWERBY, Natural. in Manchuria, vol. 4, p. 162, 1930 (Pei tai Ho, South Manchuria; Kiangsu Province in Yang-tze Delta).

Hyporhamphus sajori JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 60, 1901 (reference). --JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 26, p. 533, 1903 (Nagasaki, Matsushima, Aomori, Same, Tokyo, Misaki, Wakanoura, Kobe, Hakata); vol. 28, p. 203, 1905 (Gensan and Fusan). --FRANZ, Abh. Akad. Wiss., München, Suppl., vol. 4, pt. 1, p. 24, 1911 (Yokohama; Aburatsubo). --JORDAN and METZ, Mem. Carnegie Mus., vol. 6, p. 25, 1913 (Fusan and Chimampo). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 7 (Hakodate and Kushiro). --IZUKA and MATSUURA, Cat. Zool. Spec. Mus. Tokyo, Vertebr., p. 166, 1920 (Kasumigaura). --MORI, Hand List Manchurian Vertebr., p. 176, 1927 (compiled). --SCHMIDT and LINDBERG, Bull. Acad. Sci. U. R. S. S., p. 1138, 1930 (Tsuruga, Japan).

--SCHMIDT, Trans. Pac. Comm. Acad. Sci. U. S. S. R., p. 35, 1931 (Nagasaki, Fusan, Kagoshima). --ANONYMOUS, Ill. Jap. Aquat. An., pt. 1, pl. 21, fig. 4, 1931. --TANAKA, Journ. Faculty Sci. Univ. Tokyo, vol. 3, pt. 1, p. 50, Nov. 4, 1931 (reference). --FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 267, fig. 12, Dec. 1932 (Japan).

Belone microstoma BASILEWSKY, Nouv. Mem. Soc. Nat. Moscou, vol. 10, p. 260, 1855 (type locality: Mari prov. Shandum).

Zenarehopterus microstoma BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference; error).

Zenarchopterus microstoma CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Hemiramphus occipitalis GILL, Proc. Acad. Nat. Sci. Philadelphia, 1859, p. 148 (type locality: Shimoda, Idsu).

Hyporhamphus occipitalis JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 60, 1901 (reference).

Hyporhamphus kurumeus JORDAN and STARKS,

Proc. U. S. Nat. Mus., vol. 26, p. 534, fig. 1, 1903 (type locality: Chikugo River, Kurume, Japan). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 7, (Chilsugo River at Kurume).

Hemiramphus mioprorus JORDAN and DICKERSON,

Proc. U. S. Nat. Mus., vol.34, p. 111, fig. 1908 (type locality: Nagasaki, Japan).

Depth 11 to 13, thick or robust, sides slightly compressed; head 2 2/3 to 3¼, head from snout tip 4 3/5 to 4 7/8, width 3 1/6 to 3 1/5. Snout 2½ in head from snout tip; eye 4 1/3 to 4 4/5, 2 to 2 1/8 in snout, 1 to 1 1/8 in interorbital; maxillary reaches 3/4 to 4/5 to eye, length 2 7/8 to 3 1/6 in head from snout tip; interorbital 4 3/4 to 5 1/8, low, slightly convex. Gill rakers 10 + 24, lanceolate, 1 1/8 in gill filaments, which 2½ in eye.

Scales 90 to 105 in lateral axial series from above gill opening to middle of caudal base and 8 or 9 more on latter; 14 scales above lateral line, 3 below, 70 predorsal scales to occiput which opposite hind or vertical edge of preopercle or about 95 forward to front of snout. Small scales on dorsal and anal basally and anteriorly, also caudal base scaly. Scales with 5 or 6 radiating basal striae; circuli fine, more or less complete, less so apically.

D. II, 13 to II, 16, first branched ray 4½ to 4 4/5 in total head length; A. II, 14 to II, 16, first branched ray 4 3/5 to 5; caudal 2 2/3 to 2 3/4, little emarginate behind with lower lobe slightly longer; least depth of caudal peduncle 10 to 11½; pectoral 1 4/5 to 1 7/8; ventral 5 to 5 1/5, origin midway between gill opening and caudal base.

Brown on back, sides and below paler, with silvery white shades. Narrow silvery lateral axial streak from above gill opening to caudal base medially, widens below dorsal until little broader than pupil though much less than eye diameter. Dark bordering neutral gray line all along lateral band. Iris and side of head bright silvery white. Beak brown, usually dark. Dorsal and caudal brownish, other fins paler to whitish.

China, Korea, Japan.

A. N. S. P., nos. 29486 to 29499. Chikugo River, Kurume, Japan. D. S. Jordan and J. O. Snyder. Stanford University. Length 125 to 170 mm.

A. N. S. P., nos. 29647 to 29653. Hakodate, Hokkaido, Japan. D. S. Jordan and J. O. Snyder. Stanford University. Length 90? to 120 mm.

A. N. S. P., nos. 31732 to 31734. Kushiro, Japan. D. S. Jordan and J. O. Snyder. Stanford University. Length 237 to 248 mm.

Reporhamphus WHITLEY, Australian Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931. (Type Hemirhamphus australis STEINDACHNER, orthotypic.)

Ardeapiscis WHITLEY, Australian Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931. (Type Hemiramphus welsbyi OGILBY, orthotypic.)

Body rather robust, moderately long, sides compressed or somewhat flattened. Upper jaw very short, lower produced into long slender beak, bordered with membrane. Beak short in young, longer with age. Premaxillaries form triangular plate with teeth fitting against toothed portion of mandible. Teeth feeble, mostly tricuspid. Air bladder cellular, sometimes with many partitions. Scales moderate. Dorsal longer than anal, little advanced and last ray more or less extended. Anal not modified in males. Pectoral short. Ventral small, placed well postmedian or much nearer caudal base than gill opening.

Species numerous.

Hemiramphus lucens Valenciennes

Hemiramphus lucens VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 62, 1846 (type locality: Moluccas). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 3, pp. 231, 249, 1852 (Moluccas).

Hemirhamphus lucens WEBER and BEAUFORT, Fishes Indo Austral. Archipelago, vol. 4, p. 162, 1922 (note).

This species is underscribed and merely placed here for completeness.

Hemiramphus breviceps Castelnau

Hemirhamphus breviceps CASTELNAU, Proc. Linn. Soc. New South Wales, vol. 2, p. 240, 1878 (type locality: Brisbane River mouth).

Hemirhamphus argenteus (not BENNETT) MACLEAY,

Proc. Linn. Soc. New South Wales, vol. 6, pt. 2, p. 246, 1882 (reference). --MC CULLOCH, Amer. Mus. Mem., no. 5, pt. 1, 103, June 29, 1929 (compiled).

Depth 6 2/3 in body without caudal; head 3 1/3. Eye less than interorbital; beak equals space between snout tip and hind eye edge; beak before snout 12 in fish without caudal; beak ["back"] short, straight, pointed at extremity.

Scales 48 in lateral line.

D. 15, inserted rather behind anal; A. 15; caudal forked, lower lobe rather longer; pectoral rather longer than lower jaw, rather more than half total length of head, rays 12; ventral inserted nearer anal than end of opercle.

Back brown. Body with silvery lateral band, surmounted by blue black streak. End of beak red. Length 125 mm. (Castelnau.)

Queensland. An imperfectly known species.

Genus Hemiramphus Cuvier

Hemi-Ramphus CUVIER, Régne Animal, vol. 2, p. 186, 1817 (Type Esox brasiliensis LINNAEUS, designated by GILL, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 273.)

Hemirhamphus VOIGT, Das Thierreich, Cuvier, vol. 2, p. 383, 1832. (Type Esox brasiliensis LINNAEUS.)

Rhynchorhamphus FOWLER, Mem. Bishop Mus., vol. 10, p. 75, 1928. (Type Hemiramphus georgii VALENCIENNES, orthotypic.)

Farhians WHITLEY, Australian Zoologist, vol. 6, p. 250, August 1930. (Type Hemiramphus commersonii Cuvier, orthotypic.)

Analysis of species

a[1]. Upper jaw at least broad as long, usually little wider than long; lower jaw moderately extended.

b[1]. Reporhamphus. Dorsal and anal origins opposite, or dorsal origin only slightly in advance.

c[1]. D. 12; A. 13; scales 65.------cotnog.

c[2]. D. 13 to 18.

d[1]. Scales moderate, about 45 to 65.

e[1]. D. 13; A. 13; scales 46 to 50; lower gill rakers 18.----------

----------erythrorhinchus.

e[2]. D. 14.

f[1]. A. 16.----------intermedius.

f[2]. A. 18.----------australis.

e[3]. D. 15; A. 14 or 15.

g[1]. Dorsal and anal scaleless.--

----------laticeps.

g[2]. Dorsal and anal finely scaled; scales 48 to 50; lower gill rakers 28------

----------affinis.

e^4. D. 16 to 18; A. 14 or 15.-------

----------leucopterus.

d^2. Scales very small, 81 or 82 in lateral series; lower gill rakers 21; A. 19 or 20.---------

----------melanochir.

b^2. Hemiramphus. Anal origin well behind dorsal origin, at least below base of fifth dorsal ray or posterior; upper jaw broader than long.

h^1. Scales 46 to 65 in lateral series.

i^1. Sides without black vertical blotches.

j^1. D. 13; A. 12 or 13.

k^1. Body strongly compressed.-------

-------marginatus.

k^2. Body robust.--------

----------welsbyi.

j^2. D. 14; A. 11 or 12.

l^1. Scales 46.--------

-------robustus.

l^2. Scales 54 to 58.--
------japonicus.

i^2. Sides with 4 to 9 black vertical blotches; scales 50 to 52; D. 13 or 14; A. 11 or 12; lower gill rakers 22 to to 24.----------far.

h^2. Scales 63 to 66; D. 13 or 14; A. 12 or 13; lower rakers 20 to 30.--------
----------brasiliensis.

a^2. Rhynchorhamphus. Upper jaw greatly longer than broad; lower jaw long.----
----------georgii.

Hemiramphus cotnog H. M. Smith

Hemirhamphus cotnog H. M. SMITH, Bull. U. S. Fish Comm., vol. 21, p. 170, 1901 (Oct. 4, 1902) (type locality: Lake Buhi, Luzon).

Depth 8 in length from end of upper jaw to caudal base, sides compressed, vertical; head 2 1/3, from lower jaw tip, in total length of body. Eye large, 1 4/5 in postorbital space; premaxillaries broader than long, length less than eye; lower jaw beyond end of upper jaw rather greater than rest of head or 4 2/5 in body; interorbital 1 1/5 width of eye.

Scales 65 in lengthwise series; 9 between dorsal and anal.

D. 12, low, fin height not exceeding eye, origin slightly before anal; A. 13, very short, much higher than dorsal, first ray short, next 4 long and broad, middle rays shorter than last, free fin edge incised and nearly vertical; caudal rounded; pectoral length slightly exceeds body depth; ventral very short, much less than eye, much nearer caudal base than pectoral acil.

In formaline greenish above, scales with dark edges. White below. Silvery lateral stripe increasing in width from before backward. Dorsal dusky, other fins plain. Lower jaw black. Length 106 mm. (H. M. Smith.)

Luzon. According to Smith reported to reach a weight of ½ to 2 pounds.

Hemiramphus erythrorinchus Le Sueur

Hemiramphus erythrorinchus LE SUEUR, Journ. Acad. Nat. Sci. Philadelphia, vol. 2, pt. 1, p. 137, 1821 (type locality: no locality; near Timor and Mauritius).--FOWLER, Bull. Bishop Mus., 22, p. 6, 1922 (Guam); Mem. Bishop Mus., vol. 10, p. 77, 1928 (Apiang, Fiji, Samoa, Melle, Vavau, Namuku, Guam, Suva, Caroline); vol. 11, no. 5, p. 319, 1931 (compiled).

Hemiramphus erythrorynchus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 40, 1846 (Mauritius). --GUICHENOT, Notes Ile Réunion, vol. 2, p. 29, 1862.

Hemiramphus erythrorhynchos BLEEKER, Nat.
Tijds. Nederland Indië, vol. 3, p. 747,
1852 (Macassar).

Hememirhamphus erythrorhynchus SAUVAGE, Hist.
Nat. Madagascar, Poiss., p. 526, 1891
(name; error).

Hemirhamphus erythrorhynchus WEBER and BEAUFORT,
Fishes Indo Austral. Archipelago, vol. 4, p.
162, 1922 (note).

? Esox gambarur LACÉPÈDE, Hist. Nat. Poiss.,
vol. 5, pp. 295, 313, pl. 7, fig. 2,1803
(type locality: Sea of Arabia [not Rio
Janeiro, Brazil]).

Hemiramphus gamberur RÜPPELL, Neue Wirbelth.,
Fische, p. 74, 1835 (Massaua). --KLUNZINGER,
Verh. Zool. bot. Ges. Wien, vol. 21, p. 585,
1871 (Red Sea).

Hemiramphus dussumieri VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 33, 1846 (type locality: Seychelles). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 1, p. 160, 1850 (Banka); Verh. Batav. Genoot. (Snoek. Vissch.), vol. 24, 1852, p. 18 (Batavia), p. 27 (Singapore); Nat. Tijds. Nederland Indië, vol. 16, p. 408, 1858 (Japara, Java);Act. Soc. Sci. Ind. Néerland (Acht. Sumatra),vol. 8, 1859, p. 12 (Benculen), p. 55 (Telokbetong, Benkulen, Ulakan, Priaman); Nat. Tijds. Nederland Indië, vol. 20, p. 141, 1859-60 (Badjoa, Boni); vol. 21, p. 139, 1860 (Muntok, Banka); vol. 22, p. 108, 1860 (Muntok), p. 113 (Buru); Nederland Tijds. Dierk., vol. 1, p. 240 (Obi), p. 272 (Atapupu, Timor), 1863. --SCHMELTZ, Cat. Mus. Godeffroy, no. 1, p. 10, 1864 (South Sea); no.

2, p. 9, 1865 (South Seas). --KNER, Reise Novara, Fische, p. 322, 1865 (Madras, Nicobars). --BLEEKER, Nederland Tijds. Dierk., vol. 1, p. 176, 1865 (Siam; copied). --GUNTHER, Fishes of Zanzibar, p. 117, 1866 (Aden; Zanzibar; Seychelles). --KLUNZINGER, Verh. Zool. bot. Ges. Wien, vol. 21, p. 584, 1871 (Red Sea). --POHL, Cat. Mus. Godeffroy, no. 9, p. 38, 1884 (South Seas). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 201 (Delagoa Bay).

Hemiramphus dussumieri BLEEKER, Nat. Tijds. Nederland Indië, vol. 2, p. 210 (Boeloekomba), 1851; vol. 3, p. 54 (Singapore), p. 445 (Banka), p. 747 (Bulacomba, Celebes) 1852; vol. 6, p. 90 (Banda, Neira), p. 204 (Timor, Kupang), p. 518 (Oelakan, west Sumatra), 1854; vol. 8, p. 307 (Batoe), p. 446 (Kokos), 1855; vol. 11, p. 95 (Banda), p. 419(Muntok, Banka), 1856; vol. 12, p. 193 (Ternate), p. 217 (Nias), 1856; Act. Soc. Ind. Néerland, no. 5, vol. 1, p. 7 (Amboina), 1856; vol. 2, no. 7, p. 7 (Amboina), 1857; Nat. Tijds. Nederland Indië, vol. 13, p. 480 (Prigi, Java) 1857; Act. Soc. Sci. Ind. Néerland, vol. 3, no. 4, p. 4, 1857-58 (Macassar); Nat. Tijds. Nederland Indië, vol. 17, p. 143 (Boleling, Bali), 1858-59; vol. 18, p. 356 (Bawean), 1859, Versl. Akad. Wet. Amsterdam, vol. 12, p. 64, 1861 (Pinang).

Hemiramphus dussumierii KENDALL and GOLDSBOROUGH,

Mem. Mus. Comp. Zool., vol. 26, p. 251, 1911

(Mamuka; Mille; Kusaie; Fakarava; Vavau;

Suva; Guam).

Hemiramphus (Hyporhamphus) dussumieri WHITLEY,

Rec. Australian Mus., vol. 16, no. 1, p.

10, Oct. 7, 1927 (Michaelmas Cay, Queensland).

Hemirhamphus dussumierii PETERS, Arch. Naturg., p. 267, 1855 (Mozambique, Quellimane, Inhambane). --SCHMELTZ, Cat. Mus. Godeffroy, no. 3, p. 11, 1866 (South Sea). --GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 266, 1866 (Mozambique, Zanzibar, Seychelles, Amboyna). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 56, pl. ( ) 253, fig. 3, 1866-72 (Java, Bawean, Bali, Cocos, Sumatra, Nias, Batu, Singapore, Banka, Celebes, Termate, Obi, Buru, Amboina, Banda).--KLUNZINGER, Verh. Zool. bot. Ges. Wien, vol. 21, p. 584, 1871 (Red Sea). --ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, p. 18, 1897 (reference).

Hemirhamphus dussumieri PETERS, Monatsb. Akad. Wiss. Berlin, p. 272, 1868 (Singapore). --SCHMELTZ, Cat. Mus. Godeffroy, no. 5, p. 36, 1874 (South Sea); no. 7, p. 57, 1879 (South Sea). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). --REGAN, Ann. Natal Mus., vol. 1, p. 243, 1908 (Kosi Bay). --GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 354, 1909 (Funafuti; Jaluit; Bonham; Fiji; Society Islands). --GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 311, 1917 (compiled) --WEBER and BEAUFORT, Fishes Indo Austral Archipelago, vol. 4, p. 155, 1922 (Pulu Weh; Atjeh, Sumatra; Nias; Batavia, Java; Java Sea; Sumba; Sangi). --BARNARD, Ann. South Afr. Mus., vol. 21, pt. 2, p. 1022, Oct. 1927 (reference).

Hemirhamphus dummieri VOLZ, Nat. Tijds. Nederland Indië, vol 67, p. 178, 1907 (Priaman, Ulakan, Benkulen, Telok betung; error).

Hemirhamphus (Hyporhamphus) dussumieri BARNARD, Ann. South Afr. Mus., vol. 21, pt. 1, p. 263, June 1925 (Kosi Bay).

Hyporhamphus dussumieri JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 26, p. 535, 1903 (name). --MC CULLOCH, Australian Mus. Mem., no. 5, pt. 1, p. 102, Juen 29, 1929 (compiled).

Hyporhamphus dussumierii EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, p. 58, 1906 (1907) (Bacon; Buban).

Hemiramphus reynaldi VALENCIENNES, Hist. Nat. Poiss., vol.19, p. 39, 1846 (type locality: Trinquimalé, Ceylon; Calcutta). --DAY, Fishes of Malabar, p. 167, 1865; Proc. Zool. Soc. London, 1865, p. 309 (Cochin, Malabar).

Hemiramphus reijnaldi BLEEKER, Verh. Batav. Genoot. (Beng. Hind.), vol. 25, p. 72, 1853 (Bengal, Calcutta, Ceylon).

Hemirhamphus reynaldi DAY, Fishes of India, pt. 3, p. 515, 1877 (India); Fauna Brit. India, Fishes, vol. 1, p. 425, 1889. --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). --WEBER, Siboga Exp., no. 57, Fishes, p. 132, 1913 (Biaru; Siau). --PELLEGRIN, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Ft. Dauphin, Madagascar).

? Hemiramphus eclancheri VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 51, 1846 (type locality: Marquesas Islands). --GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 268, 1866 (copied); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 357, 1909 (copied)

Hyporhamphus samoensis STEINDACHNER, Sitzs. Ber. Akad. Wiss. Wien, Nath.-nat. Kl., vol. 115, pt. 1, p. 1418, 1906 (type locality: Upolu, Samoa).

Depth 7½ to 7 4/5 in body measured from snout tip to caudal base, body subcylindrical; head from snout tip 4 3/4, width 2 2/3 to 2 4/5. Snout 2½ to 2 3/5 in head from snout tip, free upper portion little wider than long, width in snout to eye 1¼ to 1 2/5; eye 4 1/5 to 4 2/5 in head from snout tip, 1 3/4 in snout, 1¼ in interorbital; maxillary reaches 4/5 to eye, nearly vertical, length 2 9/10 to 3 in head from snout tip; interorbital 3½, level. Gill rakers 7 + 18, lanceolate.

Scales 46 to 50 in axial lateral series to caudal base and 5 more on latter; 7 above lateral line, 2 below, 33 or 34 predorsal to occiput. Few basal scales at front of dorsal and anal. Scales with 3 or 4 basal radiating striae; circuli fine.

D. II, 11, first branched ray 2 to 2¼ in head from snout tip; A. II, 11, first branched ray 1 4/5 to 2; caudal 1 1/8, deeply emarginate; least depth of caudal peduncle 3 4/5 to 4; pectoral 1 3/5 to 1 2/3; ventral 2 3/5 to 2 4/5, inserted slightly nearer head than caudal base.

Pale brown, scales on back narrowly edged dusky. Predorsal with 3 close set parallel neutral gray lines. Narrow neutral gray streak from above pectoral axil to caudal base medially, little expanded behind. Beak and snout dusky terminally. Iris white. Fins grayish, front dorsal and anal lobes dusky, ventral pale.

Arabia, Red Sea, Zanzibar, Mozambique, Natal, Mauritius, Madagascar, Seychelles, India, Ceylon, Nicobars, Malaya, Siam, East Indies, Philippines, Queensland, Micronesia, Polynesia.

Hemiramphus intermedius Cantor

Hemirhamphus intermedius CANTOR, Ann. Mag. Nat. Hist., vol. 9, p. 485, 1842 (type locality: Chusan). --GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 260, 1866 (types; China). --ELERA, Cat. Fauna Filip., vol. 1, p. 573, 1895 (Luzon, Manila, Cavite, Santa Cruz).

Hemiramphus intermedius RICHARDSON, Ichth. China, Japan, p. 264, 1846 (Chinese Seas, Canton, Chusan). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (compiled). --ABBOTT, Proc. U. S. Nat. Mus., vol. 23, p. 490, 1901 (Tsin Tsin).

Hyporhamphus intermedius CHU, Biol. Bull. St. John's Univ., no. 1, p. 87, Jan. 1931 (compiled). --FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 266, Dec. 1932 (part). D. 14; A. 16; P. 11; V. 6. Light green above, with silvery sides. Abdomen white. Fins faint yellow. Sea, esturaries and canal. (Cantor.)

China. Although this species was united with the Australian Hemiramphus melanochir VALENCIENNIES it appears to differ chiefly in the fewer dorsal and anal rays, compared with D. and A. for the Australian species. Elera's record for Philippine materials requires confirmation.

Hemiramphus australis Steindachner

Hemiramphus australis STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, Nath.-nat. Kl., vol. 53, pt. 1, p. 471, 1866 (type locality: Port Jackson). --MC CULLOCH, Fishes of New South Wales, ed. 2, p. 31, 1927.

Hyporhamphus australis MC CULLOCH, Australian Mus. Mem., no. 5, pt. 1, p. 102, June 29, 1929 (copied).

Reporhamphus australis WHITLEY, Australian Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931 (reference).

Depth 14 in total; head 3 1/3. Snout long as broad; eye equals interorbital, 1½ in postorbital; beak before snout tip equals half head length; beak tip to eye 4 2/3 in total length; Lower gill rakers + 12.

D. II, 12; A. II, 16; dorsal and anal equally high and long; P. I, 10; ventral short, somewhat nearer caudal than gill opening.

Broad silvery band along side of body. On back 3 dark blue parallel lines between head and dorsal. Dorsal and anal, also hind caudal edge and last third of pectoral dotted with blackish. Length 280 mm.

(Steindachner.)

New South Wales.

Hemiramphus laticeps Günther

Hemirhamphus laticeps GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 267, 1866 (type locality: Fiji Islands). --GARMAN, Bull. Mus. Comp. Zool., vol. 39, p. 238, 1903 (Suva). --GUNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 355, 1909 (types).

Hemiramphus laticeps FOWLER, Mem. Bishop Mus., vol. 10, p. 77, 1928 (Fiji).

Body subtetrahedral; head 2½. Triangular part of snout broader than long; eye large, little more than interorbital and not much less than postorbital; beak before snout tip 4 2/3 to caudal base; parietal part of head broader than long.

Dorsal and anal scaleless.

D. 15, longer than anal; A. 15; caudal deeply forked, central rays long as eye; ventral base midway between pectoral axil and caudal base.

Sides with well defined narrow silvery band. Length 140 mm. (Günther.)

Fiji.

Hemiramphus affinis Günther

Hemirhamphus affinis GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 267, 1866 (type locality: South Sea); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 355, 1909 (Samoa). --FOWLER, Bull. Bishop Mus., 22, p. 31, 1925 (Samoa).

Hemiramphus affinis SEALE, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 13, 1906 (Faté, New Hebrides; Makatea, Paumotus). --JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 207, 1905 (1906) (Pago Pago; Apia). --KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 251, 1911 (Tarawa, Gilbert Islands; Kusaie and Moen, Carolines; Wotje Atoll, Marshalls; Arhno). --FOWLER,Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 8 (Apia, Samoa); Mem. Bishop Mus., vol. 10, p. 76 (type of Hemiramphus australensis Seale; Faté,Makatea, Wotje, Samoa, Tarawa, Pago Pago, Apiang, Apiang).

Hemiramphus australensis SEALE, Occas. Pap.

Bishop Mus., vol. 4, no. 1, p. 12, 1906

(type locality: Tubuai, Austral Islands).

Hemirhamphus australensis GUNTHER, Journ.

Mus. Godeffroy, vol. 8, pt. 16, p. 356, 1909

(copied).

Depth 9 3/5 to 10, body robust, subcylindrical and sides not flattened; head 2 4/5 to 2 7/8, head from snout tip 4 1/5 to 4 3/5, width 2 1/3 to 2½ in its length, width 4 2/3 to 5 in total head length from mandible tip. Snout 2 2/3 to 2 3/4 in head from snout tip; eye 3 2/3 to 3 3/4, 1¼ to 1 1/3 in snout, 1 in interorbital, 1 1/3 in postocular; maxillary reaches 3/4 to eye, length 3 2/5 to 3 3/5 in head from snout tip; interorbital 3½ to 3 3/5, low, slightly depressed. Gill rakers 11 + 28, finely lanceolate, 7/8 of gill filaments, which 2 4/5 in eye.

Scales 48 to 50 in axial lateral series from gill opening to caudal base and 4 more on latter; 6 above lateral line to dorsal origin, 1 or 2 below; 34 or 35 predorsal forward to occiput. Vertical fins all more or less finely scaled. Scales with single basal striae; circuli fine, all basal.

D. II, 13, first branched ray 2 1/6 to 2¼ in head from snout tip, last ray 4 to 4 3/5; A. II, 12 or II, 13, first branched ray 3 to 3¼; caudal 1 1/5 to 1¼, emarginate, lower lobe but little longer; least depth of caudal peduncle 4 1/5 to 4 4/5; pectoral 1 3/5 to 1 3/4; ventral 2 2/3 to 2 4/5.

Back brown, under surface paler, evidently whitish in life. On back each scale more or less dark brown broadly submarginally. Narrow silvery white axial lateral streak from above pectoral, broadest between dorsal and anal and all along upper edge narrow dark neutral gray bordering line. Iris and sides of head silvery white. Three dark parallel lines, close set, on middle of predorsal, median much broadest. Fins pale brown, dorsal dusky terminally on front lobe. Beak brown above, paler below.

Polynesia.

A. N. S. P., nos. 31030 and 31031. Apia, Samoa. Bureau of Fisheries. Length 265 to 271 mm.

A. N. S. P., one example. Shortland Island, Solomons. Alvin Seale. Bishop Museum. Length 330 mm.

Hemiramphus leucopterus Valenciennes

Hemirhamphus leucopterus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 48, 1846 (type locality: Bombay). --DAY, Fishes of India, pt. 3, p. 514, 1877 (copied); Fauna Brit. India, Fishes, vol. 1, p. 423, 1889 (copied).

Hemiramphus leucopterus BLEEKER, Verh. Batav. Genoot. (Beng. Hind.), vol. 25, p. 72, 1853 (reference).

Depth 12 in total length; head 2½. Upper jaw slightly wider at base than long, keeled, not scaled; eye 1 1/3 in postorbital, 1¼ in interorbital; beak 4½ in total length; no barbels; preorbital longer than high.

Dorsal and anal scaleless.

D. 18 (16); A. 15 (14), begins under third dorsal ray; caudal with central rays twice long as eye, lower lobe longer; pectoral rays 11; ventral rays 6, inserted at last third between eye and caudal base.

Silvery lateral band. Fins colorless. Beak black. (Day.)

India. Valenciennes gives length as 125 mm. It was said to differ from Hemiramphus xanthopterus in a much narrower head, longer and more slender beak and lower dorsal and anal fins.

Hemiramphus melanochir Valenciennes

Hemiramphus melanochir VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 41, 1846 (May 1847) (type locality: Port Western, Victoria). --CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 179, 1872 (Melbourne market); Rec. London Intern. Exhib., pt. 7, no. 5, p. 15, 1873 (Victoria).

Hemirhamphus melanochir CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 143, 1873 (Fremantle); Proc. Linn. Soc. New South Wales, vol. 2, p. 240, 1877 (Brisbane River mouth); vol. 3, p. (355) 394, 1878 (Port Jackson).

Hyporhamphus melanochir MC CULLOCH, Australian Mus. Mem., vol. 5, pt. 1, p. 102, June 29, 1929 (part; compiled).

Reporhamphus melanochir WHITLEY, Australian Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931 (reference).

Hemirhamphus intermedius (not CANTOR) GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 260, 1866 (Tasmania, South Australia, New Zealand, Bay of Islands). --KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, Math.-nat. Kl., vol. 80, pt. 1, p. 414, 1879 (Hobson Bay, Cleveland Bay, New Zealand). --HECTOR, Handbook of New Zealand, p. 16, 1879. --MACLEAY, Proc. Lenn. Soc. New South Wales, vol. 5, pt. 2, p. 181, 1881 (Port Jackson, Melbourne, Brisbane, Western Australia). --JOHNSTON, Proc. Roy. Soc. Tasmania, pp. 91, 132, 1882. --WOODS, Fish. New S. Wales, p. 84, pl. 37 (upper fig.) 1883. --OGILBY, Edible Fishes New South Wales, pl. 42, 1893, --STEAD, Fishes of Australia, p. 64, fig. 66, 1906 (New South Wales, Tasmania, Queensland, New Zealand). --ROUGHLEY, Fishes of Australia, p. 27, pl. 4, 1916 (Tasmania, New Zealand, Lord Howe Island).

Hemiramphus intermedius MC COY, Prodr. Zool. Victoria, vol. 2, dec. 14, pl. 135, fig. 1, 1889 (Victoria). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 7, (Victoria); 1923, p. 43 (Victoria material).

Hyporhamphus intermedius WAITE, Rec. Australian Mus., vol. 5, pt. 3, p. 194, March 11, 1904 (Lord Howe Island); Rec. Canterbury Mus., vol. 1, no. 1, p. 15, April 25, 1907 (reference); Rec. South Australian Mus., vol. 2, no. 1, p. 65, fig. 98, April 23, 1921. --MC CULLOCH, Australian Mus. Mem., vol. 5, p. 102, June 29, 1929 (compiled).

Depth 11 1/3 to 11 3/5, body little compressed, robust, sides convex; head 2 4/5 to 2 7/8, head from snout tip 5 to 5 1/5, width 2 3/4 to 3 1/8 in its length, 6 1/5 to 6½ in its length from mandible tip. Snout 2 2/5 to 2½ in head from snout tip; eye 4 1/5 to 4 1/3, 1 2/3 to 1 4/5 in snout, 1 to 1 1/8 in interorbital, 1 4/5 to 1 7/8 in postocular; maxillary reaches 5/6 to 7/8 to eye, length 2 7/8 to 3 in head from snout tip; interorbital 3 2/3 to 4, low, nearly level. Gill rakers 9 + 21, lanceolate, ½ of gill filaments, which 1½ in eye.

Scales 81 or 82 in axial lateral series from gill opening to caudal base, and 5 or 6 more on latter; 8 scales above lateral line to dorsal origin, 2 below to anal origin; 65 to 68 predorsal forward to occiput. Scales very caducous, most all fallen, so only pockets counted. Dorsal and anal largely with small scales basally, also caudal. Scales with 4 to 11 short marginal basal striae; circuli fine, mostly abscure apically.

D. II, 14, first branched ray 2¼ to 2 2/5 in head from snout tip; A. II, 17 or II, 18, first branched ray 2½ to 2 2/3; caudal 1¼ to 1 2/7, lunate, lower lobe only slightly longer; least depth of caudal peduncle 5 to 5 1/8, compressed; pectoral 1 3/5 to 1 3/4; ventral 3 1/3 to 3 3/4, inserted little nearer caudal base than hind edge of gill opening.

Drab or brown above, slightly paler on under surfaces. Three dark parallel lines on predorsal. Silvery axial streak along side of body, from over pectoral base where narrow and expanding widest between dorsal and anal, also all along upper edge narrow dark neutral gray bordering line. Sides of head with pale to silvery tints. Iris silver and gray. Fins brownish, darker or dusky terminally, especially pectoral. Beak dark basally, pale terminally.

Western Australia, South Australia, Victoria, Tasmania, New South Wales, Queensland and New Zealand. Mc Coy's figure of Hemiramphus intermedius does not show the base of the anal scaly. Though my specimens all show the bases of the vertical fins, at least on their membranes, buff, the hind edge of the caudal is without a contrasted dark border such as Mc Coy shows.

A. N. S. P., no. 49307 to 49309. Melbourne, Victoria, Australia. 1909. Mrs. Agnes F. Kenyon. Length 327 to 368 mm.

Hemiramphus marginatus (Forskål)

Esox marginatus FORSKÁL, Descript. Animal., pp. XIII, 67, 1775 (type locality: Djedda). --BONNATERRE, Tabl. Ichth., p. 175, 1788 (Red Sea). --GMELIN, Syst. Nat. Linn., pt. 1, p. 1393, 1789 (Red Sea). --WALBAUM, Artedi Pisc., vol. 3, p. 91, 1792 (copied). --SCHNEIDER, Syst. Ichth. Bloch, p. 393, 1801 (Red Sea). --RÜPPELL, Neue Wirbelth. Fische, p. 73, 1835 (reference).

Hemi-Ramphus marginatus CUVIER, Régne Animal, ed. 2, p. 286, 1829 (reference).

Hemiramphus marginatus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, p. 583, 1871 (Red Sea). --ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, p. 349, 1876 (Palm Islands). --WEBER, Zool. Ergebn. Reise Nederland Ost Indië, vol. 3, p. 456, 1894 (Singapore, Java, Flores, Celebes, Ternate, Amboina). --EVERMANN and SEALE, Bull Bur. Fisher., vol. 26, p. 58, 1906 (1907) (Bacon). --JORDAN and RICHARDSON, Bull Bur. Fisher., vol. 27, p. 243, 1907 (1908) (Manila). --FOWLER, Mem. Bishop Mus., vol. 10, p. 78, 1928 (Tongatabu).

Hemirhamphus marginatus GUNTHER, Cat. Fishes Brit. Mus., vol. 5, p. 270, 1866 (Amboyna). --BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 148, 1866 (Java, Duizend Island, Singapore, Pinang, Celebes, Sangi, Ternate, Amboina, Flores); Atlas Ichth. Ind. Néerland, vol. 6, p. 54, pl. (8) 254, fig. 4, 1866-72 (same localities); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 275, 1868 (Obi). --KÁROLI, Térmesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (Canton). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 182, 1881 (Palm Islands). --WEBER and BEAUFORT, Fishes. Indo Austral. Archipelago, vol. 4, p. 157, 1922 (Pulu Weh; Batavia, Cheribon, Semarang, Pekalongan, Surabaya, Panarukan, Java; Jaya Sea; Sangir; Flores; Taam).

Hemiramphus russelii VAN HASSELT, Bull. Sci. Nat. Geol. Férussac, vol. 2, p. 374, 1824 (on Kuddera B. RUSSELL, Fishes of Coromandel, vol. 2, p. 61, pl. 177, 1803, type locality: Vizagapatam).

Hemiramphus russeli VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 32, 1846 (Pondichery). --BLEEKER, Verh. Batavia. Genoot., no. 6, vol. 24, p. 16, 1852 (Batavia), 27 (Pinang); (Beng. Hind.), vol. 25, p. 72, 1853 (reference); --KÁROLI, Térmesz. Füzetek, Budapest, vol. 5, p. 36, 1881 (Singapore).

Hemiramphus russelli CANTOR, Journ. Asiat. Soc. Bengal, vol. 18, p. 1229, 1849 (1850) (Pinang). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 8, p. 344, 1855 (Duizend Islands); vol. 10, p. 362, 1856 (Ternate); vol. 16, p. 408, 1858 (Japara, Java); Versl. Akad. Wet. Amsterdam, vol. 12, p. 32, 1861 (Singapore); Nederland Tijds. Dierk., vol. 1, p. 249, 1863 (Flores).

Hemiramphus russellii BLEEKER, Verh. Batavia. Genoot., vol. 25, p. 8, 1853 (on Kuddera B. RUSSELL); Nat. Tijds. Nederland Indië, vol. 4, p. 133, 1853 (Ternate); vol. 5, p. 319, 1853 (Amboina); vol. 12, p. 193, 1856 (Ternate); Act. Soc. Sci. Ind. Néerland, no. 5, vol. 1, p. 7, 1856 (Amboina); no. 7, vol. 2, p. 7, 1857 (Amboina); Nat. Tijds. Nederland Indië, vol. 13, p. 374, 1857 (Sangi). --KNER, Reise Novara, Fische, p. 323, 1865 (Madras).

Hemirhamphus russelli GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 268, 1866 (copied). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 55, 1866-72 (Pinang). --WEBER, Fishes Indo Austral. Archipelago, vol. 4, p. 161, 1922 (copied).

Hemirhamphus russellii SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). --DUNCKER, Mitteil. Nat. Mus. Hamburg, vol. 21, p. 170, 1903 (1904) (Compiled).

Hemi-Ramphus brevirostris CUVIER, Règne Animal, ed. 2, vol. 2, p. 286, 1892 (on Kuddera B. RUSSELL).

Hemiramphus brevirostris VALENCIENNES, Règne Animal, Ill., Poiss., p. 235, 1839; Hist. Nat. Poiss., vol. 19, p. 24, 1846 (reference).

Hemirhamphus brevirostris STEINDACHNER, Abh. Senckenberg. Ges., vol. 25, p. 450, 1900 (Batjan).

Hemiramphus lutkei VALENCIENNES, Hist. Nat. Poiss., vol. 18, p. 49, 1846 (type locality: Bourou; Manila). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 3, pp. 232, 249, 1852 (Boeroe).

Hemirhamphus lutkei BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 150, 1866 (Buru; Luzon).

Hemiramphus fasciatus BLEEKER, Nat. Tijds. Nederland Indië, vol. 5, p. (69) 89, 1853 (type locality: Lawajong, Solor). --WEBER, Siboga Exp., vol. 57, Fische, p. 131, 1913 (Bajan Bay; West Taain Island).

Hemirhamphus fasciatus GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 271, 1866 (type; Lawajong). --BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 152, 1866 (Solor); Atlas Ichth. Ind. Néerland, vol. 6, p. 57, pl. (5) 251, fig. 2, 1866-72 (Solor).

Hemirhamphus plumatus BLYTH, Journ. Asiatic Soc. Bengal, vol. , p. 288, 1858.

Depth 8½ to 9 1/4, moderately compressed; head 2½ to 2 3/5, head from snout tip 4 1/6 to 4¼, width 2 3/4 to 2 7/8. Snout 2 4/5 to 3 in head from snout tip; eye 3½ to 3 3/4, 1 2/5 to 1½ in snout, equals interorbital; maxillary reaches 2/3 to 3/4 in snout, length 3 3/5 to 3 4/5 in head from snout tip; interorbital 4 1/8 to 4 1/5, low, level. Gill rakers 6 + 18 to 20, lanceolate, 1½ in gill filaments, which 1 3/5 in eye.

Scales 46 or 47 in axial lateral series from above gill opening to caudal base and 4 or 5 more on latter; 6 above, 2 below, 33 or 34 predorsal forward to occiput or 40 forward to snout end. Dorsal and anal largely scaleless, or only few small scales anteriorly basally small scales on caudal base. Scales with single short basal marginal stria; circuli fine, more or less complete, little coarser basally.

D. II, 11, first branched ray 4 4/5 to 5 in total head length; A. II, 10, first branched ray 5 to 7 1/5; caudal 1 4/5 to 2, well forked, upper lobe 1 1/5 to 1 2/5 in lower lobe; least depth of caudal peduncle 7 3/4 to 8 in total head length; pectoral 2 3/5 to 2 4/5; ventral 4 7/8 to 5 1/3; origin slightly nearer pectoral tip than caudal base.

Back drab or light brown, sides and below paler to whitish. Where scales fall from back exposed pockets broadly edged blackish brown. Dark line down middle of back. Gray axial lateral band, from above pectoral base to middle of caudal base, widest between dorsal and anal where little less than vertical eye diameter. Along upper edge of lateral band darker bordering line. Iris and side of head silvery white. Beak dusky. Dorsal and caudal gray to pale dusky, other fins whitish.

Red Sea, India, Malaya, East Indies, Philippines, China, Queensland, Polynesia.

7825. Cebu market. April 7, 1908. Length 220 mm, beak broken off.

2 examples. Jolo, Jolo Island. February 8, 1908. Length 26? to 30 mm.

1 example. Jolo Anchorage, Jolo. March 5, 1908. Length 75 mm.

1 example. Malcochin Harbor, Linapacan Island. December 18, 1908. Length 43 mm, without beak and most of caudal.

A. N. S. P., nos. 55967 to 55970. Orani, Bataan Province, Luzon. April 28, 1923. Rev. J. Clemens. Purchased. Length 213 to 242 mm.

Hemiramphus welsbyi Ogilby

Hemirhamphus welsbyi OGILBY, Proc. Roy. Soc. Queensland, vol. 21, p. 91, 1908 (type Moreton Bay, Queensland).

Ardeapiscis welsbyi WHITLEY, Austral. Zoologist, vol. 6, pt. 4, p. 314, Feb. 13, 1931 (reference).

Depth 8 1/5, body robust; head 2 2/3. Premaxillary plate wider than long; eye 1½ in postocular, equals or little less than interorbital; lower jaw before tip of upper jaw 1/7 longer than rest of head or 4 9/10 in body.

Scales 50 in lateral series; 6 above. Dorsal and anal scaleless.

D. 13, begins far before anal, 1 3/5 times anal length, last ray extended but not reaching caudal base; A. 12 or 13; caudal forked, median rays 5/6 of eye and 4 4/5 in lower lobe, which 5 2/5 in body, pectoral rays 12, long as head behind mouth angle; ventral origin midway between caudal base and middle third of pectoral, length 1 7/8 in head from snout tip, inner ray extended but not reaching vent.

Back dark green. Sides with conspicuous silvery band, widest below dorsal, tapers toward either extremity, bordered above by blue line. Lower parts pearly white. Front dorsal rays, outer and middle caudal rays, upper pectoral rays and middle ventral rays dusky, Length 400 mm.

(Ogilby.)

Queensland.

Hemiramphus robustus Günther

Hemirhamphus robustus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 270, 1866 (type locality: Long Island, Tasmania).

Depth 5½ in length from snout tip to caudal base, body compressed, elevated; head 2½. Triangular part of upper jaw formed by premaxillaries much broader than long; eye 1½ in postorbital, equals interorbital; lower jaw before tip of upper jaw 4 2/3 in body without caudal; interorbital flat.

Scales 46 in lateral line. Dorsal and anal with thin scales anteriorly.

D. 14, much longer than and begins before anal; A. 11; caudal deeply forked, central rays shorter than eye; pectoral rays 11; ventral little nearer caudal than pectoral axil.

Sides with broad silvery band. Length 305 mm.

(Günther.)

Tasmania.

Hemiramphus japonicus Brevoort

Hemiramphus japonicus BREVOORT, Narr. Exp. Japan, Perry, vol. 2, p. 280, 1856 (type locality: Loo Choo). --IZUKA and MATSUURA, Cat. Zool. Spec. Mus., Tokyo, Vertebr., p. 166, 1920 (Inatori, Izu). --FOWLER, Mem. Bishop Mus., vol. 10, p. 75, 1928 (copied).

Hyporhamphus japonicus JORDAN and SNYDER, Annot. Zool. Japon., Tokyo, p. 60, 1901 (reference). --JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 26, p. 535, 1903 (copied). --TANAKA, Journ. College Sci. Tokyo, vol. 23, no. 7, p. 29, 1908 (Habajima, Bonin Islands).

Body rather elongate, little compressed, caudal peduncle compressed; head 2 2/3 to center of hind caudal edge, head from snout tip 4 8/9 to caudal base. Eye large, lateral, high, nearer snout tip than hind opercle edge; beak long, stout; teeth in jaws minute, none on palate; interorbital broad, gently convex.

Scales 54 in lateral series to caudal base. No lateral line.

D. 14, second ray longest; A. 12, origin below middle of dorsal base, second ray long; caudal deeply forked, lobes pointed, lower longer and broader; pectoral rays 11, fin long; ventral rays 6, origin nearer anal than pectoral.

In formaline bluish, dark on back, lighter below. Beak dark. Dorsal and caudal dusky, paired fins little lighter. Anal whitish. Length about 390 mm. (Tanaka.)

Rui Kui, Japan, Bonin Islands. Although Girard does not give any fin counts he describes the color as bluish, darkest on back and lighter below. Tinge of green on sides and upper lobe of caudal. Narrow green stripe on middle of sides from pectoral to caudal and broader bordering stripe on each side pale silvery blue tinged with greenish. Beak dark indigo blue towards tip, lighter basally. Fins pale bluish, caudal dark dusky blue.

Hemiramphus far (Forskål)

Esox far FORSKÅL, Descript. Animal. 1775, pp. 13, 67, (type locality: Lahaja, Red Sea). Hemiramphus far RÜPPELL, Neue Wirbelth., Fische, p. 74, 1835 (Red Sea). --BLEEKER, Act. Soc. Sci. Ind. Néerland (Act. Sumatr.), vol. 8, p. 55, 1859 (Benkulen, Priaman, Siboga); Nat. Tijds. Nederland Indië, vol. 22, p. 101, 1860 (Singapore); Nederland Tijds. Dierk., vol. 1, p. 240, 1860 (Obi), p. 272 (Atapupu, Timor). --KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, p. 582, 1871 (Red Sea). --JORDAN and EVERMANN? Proc. U. S. Nat. Mus., vol. 25, 1902, p. 329 (Formosa). --FOWLER, Journ. Acad. Nat. Scil Philadelphia, Ser. 2, vol. 12, p. 501, 1904 (Padang). --JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, p. 175, 1909 (Takao, Formosa). --KENDALL and GOLDSBOROUGH,

Mem. Mus. Comp. Zool., vol. 26, p. 252, 1911 (Vavau, Tonga). --WEBER, Siboga Exp., vol. 57, Fische, p. 129, 1913 (Kawa, west Ceram; Atjatuning, west New Guinea). --FOWLER, Copeia,, no. 58, p. 62, June 18, 1908 (Philippines); Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 7 (Philippines, Padang, Zanzibar). --FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, p. 14, 1922 (Takao). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 262 (Philippines). --WHITLEY, Journ. Pan. Pacific, Res. Inst., vol. 3, no. 1, p. 11, Jan. Mar. 1928 (Santa Cruz Island). --FOWLER, Mem. Bishop Mus., vol. 10, p. 77, 1928 (Shortland, Samoa, Fiji, Vavau, New Guinea); vol. 11, no. 5, p. 319, 1931 (compiled). --CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 86, Jan. 1931 (reference). --FOWLER, Hong Kong Naturalist, vol. 3, nos.

3-4, p. 269, fig. 13, Dec. 1932 (Zanzibar,

East Indies, Philippines, Melanesia, Polynesia).

Hemirhamphus far PETERS, Archiv Naturg., p. 267, 1855 (Licurare, Mozambique). --GUNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 271, 1855 (Natal, Mozambique, Zanzibar, Amboina). --BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 54, 1866-72, (Java, Madura, Sumatra, Singapore, Banka, Celebes, Halmaheira, Ternate, Batjan, Obi-major, Amboina, Ceram); Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (China). --DAY, Fishes of India, pt. 3, p. 516, pl. 120, fig. 3, 1877 (Madras). --BLEEKER, Verh. Kon. Adad. Wet. Amsterdam, vol. 18, no. 3, p. 2, 1879 (Mauritius). --DAY, Fauna Brit. India, Fishes, vol. 1, p. 424, 1889. --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). --DUNCKER, Mitteil. Nat. Mus. Hamburg, vol. 21, p. 147, 1903 (1904) (Singapore). --STEINDACHNER, Sitzs. Ber. Akad. Wiss. Wien, Math.-nat. Kl.,

vol. 115, pt. 1, p. 1417, 1906 (Upolu, Samoa).

--STEAD, Fishes of Australia, p. 64, 1907

(New South Wales, Queensland). --GUNTHER,

Journ. Mus. Godeffroy, vol. 8, pt. 16, p.

357, 1909 (Ponapé, Pelau, Fiji, Society

Islands). --BEAUFORT, Bijd. Dierk. Amsterdam

p. 104, 1913 (Ambon). --BOULENGER, Cat. Fresh

water Fishes Africa, vol. 3, p. 15, fig. 9

(copied) (Zanzibar; Mazambique; Mazoë, Rhodesia;

Natal). --GILCHRIST and THOMPSON, Ann. Durban

Mus., vol. 1, pt. 4, p. 310, 1917 (compiled).

--WEBER and BEAUFORT, Fishes Indo Austral.

Archipelago, vol. 4, p. 156, 1922 (Madura;

Taman Bay, Celebes; Ambon; Ceram; Atjatuning,

New Guinea).

Hemirhamphus (Hemirhamphus) far BARNARD, Ann. South Afric. Mus., vol. 21, pt. 1, p. 362, June 1925 (False Bay, Natal).

Hemi-Ramphus commersonii CUVIER, Régne Animal, ed. 2, vol. 2, p. 286, 1829 (reference).

Hemiramphus commersonii VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 28, 1846 (Mauritius, Red Sea, Massawah, Suez, Seychelles, Africa, Zanzibar, Vanikoro, Malacca). --GUICHENOT, Notes Ile Réunion, vol. 2, p. 29, 1862. --MARTENS, Reise Ost. Afrika, Decken, vol. 3, pt. 1, p. 143, 1869 (Licuare River). -- ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, p. 349, 1876 (Cape York). --SEALE, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 13, 1906 (Shortland Island). --GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 266, 1908-11 (Natal; Durban). --SNYDER, Proc. U. S. Nat. Mus.

vol. 42, p. 494, 1912 (Okinawa, Riu Kiu).

Hemiramphus commersonii BLEEKER, Verh. Batav. Genootsch. (Snoek. Vissch.), vol. 24, p. 17, 1852 (Batavia, Samarang, Tjilatjah, Pasuruan; Siboga); Nat. Tijds. Nederland. Indië, vol. 3, 1852, p. 718 (Tandjong Berikat at Koba, Banka), p. 741 (Kema, Celebes); vol. 4, 1853, p. 597 (Halmaheira); vol. 6, 1854, p. 51 (Sindangole, Halmaheira); vol. 7, 1854, p. 228 (Macassar), p. 314 (Bantem); vol. 8, 1855, p. 296 (Ternate); Act. Soc. Sci. Ind. Neerland., No. 3, vol. 1, p. 5 (Manado), p. 8 (Macassar), 1856; No. 5, p. 7 (Amboina), 1856; Nat. Tijds. Nederland. Indië, vol. 13, 1857, p. 385 (Batjan); Act. Sco. Sci. Ind. Neerland., No. 7, vol. 2, p. 7 (Amboina), 1857; No. 4, vol. 4, 1857-58, p. 4 (Macassar). --GUNTHER, Cat. Fish. Brit. Mus., vol. 6, p. 271, 1866 (Natal, Mozombique, Zanzibar, Amboyna). --BLEEKER, Atlas Ichth. Ind. Neerland., vol. 6, 1866-72, pl. ( ) 252, fig. 3. --SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 25, 1869 (Samoa). --CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 120, 1873

(Noumea, New Caledonia). --PETERS, Monatsb. Akad. Wiss. Berlin, p. 445, 1876 (Mauritius). --DAY, Fishes of India, pt. 3, p. 516, p. ( ) 120, fig. 3, 1877. --GÜNTHER, Rep. Voy. Challenger, vol. 1, pt. 6, p. 36, 1880 (Kandavu, Fiji). --KÁROLI, Termesz. Füzetek, Budapest, vol. 5, p. 182, 1881 (no locality). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 183, 1881 (Port Jackson to Cape York); vol. 7, pt. 2, p. 593, 1882 (New Guinea). --BOULENGER, Proc. Zool. Soc. London, 1887, p. 666 (Muscat). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). --ELERA, Cat. Fauna Filip., vol. 1, p. 575, 1895 (Luzon, Batanga, Nasugbu). --JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 207.

Hemirhamphus commersoni GÜNTHER, Rep. Voy, Challenger, vol. 1, 1880, pt. 6, p. 50 (Somerset, Queensland). --VOLZ, Nat. Tijds. Nederland Indië, vol. 46, p. 179, 1907 (Siboga, Priaman, Benkulen).

Hemiramphus moar THIOLLIÈRE, Fauna Woodlark, p. 205, 1857 (type locality: Woodlark Island).

Hemirhamphus obesus CASTEBNAU, Mem. Poiss. Afr. Australe, p. 64, 1861 (type locality: Port Natal). --GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 311, 1917 (compiled).

Hemiramphus obesus GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, 1917, p. 311 (compiled).

Hemiramphus obesus GILCHRIST and THOMPSON, Marine Invest. South Africa, p. 152, 1901 (reference).

Hemiramphus marginatus (not FORSKÅL)JOUAN, Mém. Soc. Sci. Nat. Chérbourg, vol. 21, p. 334, 1877-78 (on JOUAN, op. cit., vol. 8, p. 304, 1861, Port de France and Kanala, New Caledonia).

Hemiramphus mocquardianus THOMINOT, Bull. Soc. Philomath. Paris, ser. 7, vol. 10, p. 165, 1886 (type locality: Camboja).

Depth 6 2/5 to 8½, body compressed with flattened sides; head 2 2/5 to 2 2/3, head from snout tip 4¼ to 4 2/5, width 5 to 6 in head from mandible tip. Snout 2 7/8 to 3 in head from snout tip; eye 3 3/4 to 4, 1 1/3 to 1 2/5 in snout, 1 to 1 1/3 in interorbital; maxillary reaches 3/4 to 4/5 to eye, length 3 1/3 to 3 2/5 in head from snout tip; mandible before snout tip 5 to 5 1/5 in total length; interorbital 3 1/4 to 4 in head from snout tip, level, low. Gill rakers 8 or 9 + 22 to 24, lanceolate, subequal with gill filaments, which 2 in eye.

Scales 50 to 52 in axial lateral series to caudal base and 5 or 6 more on latter; 7 above; 30 or 31 predorsal forward to occiput or opposite gill opening. Dorsal and anal scaly basally and anteriorly and caudal largely with minute scales.

D. II, 11 or II, 12, first branched ray 1 7/8 to 2 in head measured from snout tip; A. II, 9 or II, 10, first branched ray 3 1/3 to 3 3/5; least depth of caudal peduncle 3 1/6 to 3½; pectoral 1 1/3 to 1 2/5; ventral 1 7/8 to 2¼.

Back and upper surfaces brown, each scale with dark brown submarginal crescent. Sides and below bright silvery white. Along side of back 7 dark or vertical short blackish bars. Usually an underlaid bright silvery axial band along side, bordered with narrow gray band or streak above most its whole extent. Iris silvery white. Fins pale or whitish, front of dorsal lobe and caudal darker or dusky.

Red Sea, Arabia, Zanzibar, Mozambique, Natal, Maurituis, Seychelles, India, Malaya, East Indies, Philippines, Indo China, Formosa, Rui Kui, Melanesia, Micronesia, Polynesia, Queensland, New South Wales.

4982. Bongao Island. February 23, 1908. Length 308 mm.

5547. Catanigan, Masbate. April 18, 1908. Length 381 mm.

22318. Cebu. March 13, 1909. Length 245 mm.

6130, 6131. Mansalay, Mindoro. June 4, 1908. Length 292 to 341 mm.

4766, 4767. Nogas Point, Panay. February 4, 1908. Length 293 to 345 mm.

4 examples. Port Uson west of Pinas Island. December 17, 1908. Length 260 to 304 mm.

4569, 4570. Subig Bay, Olongapao. January 7, 1908. Length 300 to 311 mm.

4921, 4922. Tataan, Simaluc Island. February 20, 1908. Length 306 to 365 mm.

A. N. S. P., no. 7529. Zanzibar. Dr. W. S. W. Ruschenberger. Length 115 mm.

A. N. S. P., nos. 27464 to 27467. Padang, Sumatra. A. C. Harrison and H. M. Hiller. Length 257 to 300 mm.

A. N. S. P., nos 49293. Philippines. Commercial Museum of Philadelphia. Length 283 mm.

A. N. S. P., one example. Shortland Island, Solomons. Alvin Seale. Bishop Museum (1332). Length 332 mm.

A. N. S. P., one example. Philippines. Rev. Joseph Clemens. 1923. Purchased. Length 375 mm.

Hemiramphus brasiliensis (Linnaeus)

Esox brasiliensis LINNAEUS, Syst. Nat., ed. 10, pt. 1, p. 314, 1758 (type locality: Southern America [=Jamaica]); ed. 12, pt. 1, p. 517, 1766 (India). --GMELIN, Syst. Nat. Linn., pt. 1, p. 1393, 1789 (India). --WALBAUM, Artedi Pisc., vol. 2, pp. 92, 93, 1792 (copied). --BLOCH, Naturg. Ausl. Fische, vol. 8, p. 145, pl. 391, 1794 (East Indies). --FORSTER, Fauna Indica, p. 16, 1795. --SCHNEIDER, Syst. Ichth. Bloch, p. 392, 1801 (India). --LICHTENSTEIN, Descr. An. Forster, p. 155 (tropical Pacific), p. 257 (Tanna Island), 1844. --KITTLITZ, Denks. Reise. Mikronesien, vol. 2, p. 20, 1858 (Ualan).

Hemiramphus brasiliensis JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 434, 1902 (1903) (Honolulu). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 7 (Honolulu); Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii). --FOWLER and BALL, Bull. Bishop Mus., 26, p. 8, 1925 (Lisiansky). --FOWLER, Mem. Bishop Mus., vol. 10, p. 76, 1928 (Nukuhiva, Honolulu, Marcus, Palmyra, Lisiansky Islands); vol. 11, no. 5, p. 319, 1931 (Honlulu).

Hemiramphus depauperatus LAY and BENNETT, Zool Beechey's Voy., p. 66, 1839 (type locality: Oahu). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 499, pl. 19, fig. 3 (Hawaiian Islands). --SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1903) (Honolulu and off Molokai, 13 fathoms). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 127, fig. 42, 1903 (Honolulu).

Hemirhamphus depauperatus BRYAN and HERRE, Occas. Pap. Bishop Mus., vol. 2, no. 1, p. 127, 1902 (1903) (Marcus Island). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 357, 1909 (Greenwich Island).

Hemiramphus pacificus (not STEINDACHNER) SEALE, Occas. Pap. Bishop Mus., vol. 1, no. 5, p. 19, 1902 (Honolulu).

Hemirhamphus eclancheri (not VALENCIENNES) SEALE, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 13, 1906 (Nukuhiva).

Depth 9 2/3 to 10, body well compressed, sides flattened; head 2½ to 2 3/5, head from snout tip 4 2/5 to 4 2/3, width 2 4/5 to 3. Snout 2 4/5 to 2 7/8 in head from snout tip; eye 4 to 4¼, 1½ to 1 2/3 in snout, 1 to 1 1/5 in interorbital; maxillary reaches 2/3 to 3/4 in snout, length 3 2/3 to 4 in head from snout tip; interorbital 4 to 4¼, flat. Gill rakers 11 + 29 or 30, lanceolate, length 1¼ in gill filaments, which 1 4/5 in eye.

Scales 57 to 59 in axial lateral series from above gill opening to caudal base and 6 or 7 more on latter; 7 above, 2 below, 39 or 40 predorsal forward to occiput. Vertical fins largely with small scales. Scales with 1 to 4 short basal close set radiating striae; circuli as very fine vertical parallel striae, usually more or less complete.

D. II, 11 or II, 12, first branched ray 5 7/8 to 6 in total head; A. II, 10 or II, 11, first branched ray 7 3/4 to 8; caudal well forked, lower lobe much longer or 2¼ to 2 2/3; least depth of caudal peduncle 9 to 10; pectoral 2 2/5 to 2 3/5; ventral 6 to 6¼, origin about an eye diameter nearer caudal base than pectoral base.

Back and upper surfaces brown, sides and below paler to whitish. Sides of head with silvery white reflections. Iris silvery white. Fins all dull browmish.

India, East Indies, Micronesia, Polynesia, Hawaii. Also in the tropical and subtropical Atlantic.

A. N. S. P., no. 7530 to 7532. Hawaiian Islands. Dr. J. K. Townsend. Length 340 to 357 mm.

A. N. S. P., nos. 29501 and 29502. Honolulu. Dr. T. D. Wood. Stanford University. Length 247 to 255 mm.

A. N. S. P., one example. Honolulu. J. W. Thompson. Bishop Museum. Length 380 mm.

A. N. S. P., two examples. Honolulu 1923. Henry W. Fowler. Length 300 to 320 mm.

Hemiramphus georgii Valenciennes

Hemiramphus georgii VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 37, pl. 555, 1846 (type locality: Mahé Bay, Coromandel). --CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 1, p. 1230, 1849 (1850) (Pinang). --JERDON, Madras Journ. Lit. Sci., 1851, p. 147. --BLEEKER, Verh. Batavia, Genoot., (Snoek. Viss.), vol. 29, p. 19, 1852 (Batavia), p. 27 (Pinang); (Beng. Hind.), vol. 25, p. 72, 1853 (compiled); Act. Soc. Sci. Ind. Néerl., no. 6, vol. 3, p. 2, 1857-58 (Sinkawang, Borneo); no. 7, vol. 5, p. 2, 1858-59 (Sinkawang); Naturk. Tijds. Nederland Indië, vol. 17, p. 143, 1858-59 (Boleling, Bali); Versl. Akad. Wet. Amsterdam, vol. 12, p. 32, 1861 (Singapore). --DAY, Fishes of Malabar, p. 170, 1865 (copied). --PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 445 (Mauritins). --SAUVAGE, Hist. Nat. Madagascar,

Poiss., p. 526, 1891 (reference). --PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 4, p. 228, 1898 (Guam). --JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 329, 1902 (Formosa). --ROULE, Mém. Soc. Zool. France, vol. 15, p. 316, 1902 (Port Said). --JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, p. 176, 1909 (copied). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 262 (Orion, Philippines); Mem. Bishop Mus., vol. 10, p. 75, 1928 (Kingsmills); Proc. Acad. Nat. Sci. Philadelphia, 1929, p. 603 (Hong Kong); Hong Kong Naturalist, vol. 3, nos. 3-4, p. 269, fig. 14, Dec. 1932 Hong Kong, Philippines, Microveria).

Hemirhamphus georgii BLYTH, Prodr. Faun. Zeylon. Kelaert, p. 87, 1857 (Ceylon). --KNER, Reise Novara, Fische, p. 323, 1865 (Madras). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 264, 1866 (Bengal; Pinang) --DAY, Fishes of India, pt. 3, p. 515, pl. 120, fig. 2, 1877; Fauna British India, Fishes, vol. 1, p. 424, 1889. --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). --ELERA, Cat. Fauna Filip., vol. 1, p. 575, 1895 (Cebu). --DUNCKER, Mitteil. Naturk. Mus. Hamburg, vol. 21, p. 170, 1903 (1904) (reference). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. , p. 355, 1909 (compiled). --WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 147, fig. 56, (pharyngeal arches) 1922 (Pulu Weh; Bagan Api Api, Sumatra; Batavia, Semarang, Pekalongan, Java; Java Sea).

Hemirrhamphus georgii GORGOZA, An. Soc. Espan. Hist. Nat., Madrid, vol. 14, p. 73, 1885 (Comprado; error).

Hemiramphus longirostris (not VALENCIENNES) BLEEKER, Nat. Geneesk. Arch. Nederland Indië (Batavia), vol. 2, p. 512, 1845 (Batavia).

Hemirhamphus cantoris GÜNTHER, Cat. Fish. Brit. Mus., vol. 6, p. 264, 1866 (type locality: Amoy; China Seas). --ELERA, Cat. Fauna Filip., vol. 1, p. 575, 1895 (Luzon, Cavite, Santa Cruz). --DUNCKER, Mitteil. Nat. Mus. Hamburg, vol. 21, p. 170, 1903 (1904) (Kuala Lumpur).

Hemirhamphus cantori BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 145, 1866 (Java, Bali. Pinang, Singapore, Borneo); Atlas Ichth. Ind. Neerland, vol. 6, p. 53, pl. ( ) 252, fig. 2, 1866-72 (same localities); Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (Amoy). --DAY, Fishes of India, vol. 3, p. 514, pl. 119, fig. 1, 1877. --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 593, 1882 (New Guinea). --DAY, Fauna British India, Fishes, vol. 1, p. 423, fig. 137, 1889.

Hemiramphus cantoris JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, p. 8, 1906 (1907) (Cavite). --SEALE, Philippine Journ. Sci., vol. 9, p. 60, 1914 (Hong Kong). FOWLER, Copeia, no. 58, p. 62, June 18, 1918 (Philippines).

Hemiramphus cantori WII, Contrib. biol. Lab. Sci. Soc. China, vol. 5, no. 4, p. , fig. 53, 1929 (Amoy).

Depth 12¼ to 12 3/4, body robust, little compressed, sides somewhat flattened and approximated below; head 2 2/5 to 2 3/5, head from snout tip 4¼ to 4 2/5, width 3 to 3¼. Snout 2 1/5 to 2 2/5 in head from snout tip, width 1 2/3 to 1 3/4 in its length; eye 4 1/3 to 4½ in head, 1 1/8 to 2 in snout, 1 1/8 to 1¼ in interorbital; maxillary reaches 4/5 to 7/8 to eye, length 2½ to 2 2/3 in head from snout tip; interorbital 3 2/3 to 4, nearly level, only slightly depressed medially. Gill rakers 15 + 42, lanceolate, equal gill filaments, which 2 2/5 in head.

Scales 56 to 58 in lateral axial series from above gill opening to middle of caudal base and 6 or 7 more on latter; 7 above, 3 below, 41 or 42predorsal forward to occiput. Dorsal and anal scaleless, or only very few basally. Caudal scaly basally. Scales with 1 or 2 basal radiating striae; circuli rather coarse.

D. III, 12, first branched ray 6 to 6¼ in total head length; A. II, 12, first branched ray 6 3/4 to 7; caudal 2 2/3 to 3 1/5, deeply emarginate, upper lobe 1 2/5 to 1 3/5 in lower; least depth of caudal peduncle 12 to 12½; pectoral 4 to 4¼; ventral 8 to 11 1/3, origin midway between depressed pectoral tip and caudal base.

Back pale brown, where scales fallen pockets dusky to to neutral black. Dark line down middle of predorsal. Sides and lower surface little paler, evidently whitish or silvery white in life. Gray white to silvery axial band from above gill opening, narrow, widest betweend dorsal anal where equal to pupil diameter. Edge above of lateral band as dark neutral gray line. Iris and side of head silvery white. Dorsal, caudal and pectoral brownish, other fins whitish. Beak and top of head dark. Rather bfoad cutaneous flap along edge of beak neutral black marginally.

Red Sea, Maurituis, India, Ceylon, Malaya, East Indies, Philippines, China, Formosa, Micronesia.

1 emample. Abuyog, Leyte. July 26, 1909. Length 223 mm.

5322. Catbalogan market, Samar. April 16, 1908. Length 305 mm.

1 example. Manila market, Luzon. April 15, 1909. Length 150 mm.

21927. Manila market. April 16, 1909. Length 201 mm.

3 examples. Maricaban Port, Luzon. July 20, 1908. Length 90 to 115 mm.

1 example. Nasugbu. January 15, 1908. Length 42 mm.

1 example. Nogas Point, Panay. February 3, 1908. Length 78 mm.

1 example. Ragay Bay, Ragay Gulf, Luzon. March 9, 1909. Length 56 mm.

2 examples. Tumindao anchorage. February 25, 1908. Length 44 to 58 mm.

1 example. Sandakan anchorage, Borneo. March 1, 1908. Length 240 mm.

D. 5633. Selong Point, N. 24° W., 11.8 miles (lat. 1° 03' 00"S., long. 127° 44'00" E.), south of Patiente Strait. December 2, 1909. Length 36 mm.

A. N. S. P., nos. 55963 to 55966. Orian, Bataan Province, Luzon, May 11, 1923. Rev. J. Clemens. Purchased. Length 260 to 315 mm.

Family EXOCOETIDAE

Body oblong or moderately long. Head with vertical sides, approximating below. Mouth moderately large, terminal. Jaws not extended in a beak, except in some of very young. Premaxillaries not protractile, with straight transverse front edge. Upper jaw edge chiefly formed by premaxillaries and short maxillaries with lateral edge. Maxillary free from or merely adherent to premaxillary, its edge slipping below front of preorbital. Teeth various, villiform, small or weak, Nostrils large, double, near eye. Gill membrances not united, free from isthmus. Gill rakers variable. Gills 4, slit behind fourth. Vertebrae 44 to 52. Pseudobranchiae hidden, glandular. Air bladder very large, not cellular, extends far back among haemopophyses from caudal vertebrae. Shoulder girdle and pectoral muscle very strong. Scales deciduous, cycloid, rather large, extend over head. Lateral line low, runs along lower side of body. Dorsal posterior, opposite and similar to anal. No finlets. Caudal forked, lower lobe longer. Pectoral large, inserted high, used as organs of flight. Ventral abdominal, of several soft rays, inserted usually postmedian, occasionally median or premedian. Vent close before anal.

Carnivorous and herbivorous fishes living in all warm seas, mostly pedagic, swimming near the surface and skipping or sailing through the air sometimes for considerable distances. They are readily known by their long pectoral fins. In some forms they are not so greatly prolonged (Oxyporhamphus) while in others the ventrals are also prolonged to assist in flight (Cypselurus).

Much discussion as to the flight of these fishes has been published. Their motive power is due to the action of the strong tail while in the water. The fish suddenly leaping out are planed by their pectorals extended like a parachute rather than as wings, so that the fish may finally fall or slip back into the sea with a splash. Every gradation from the leaping or scuttling along the surface, as with the green gars and balaos, to the most bird like flight may be excountered among these fishes and their allies.

"Much has been written of the flight of the Flying-fish; and we have ascertained, chiefly from Möbius, that it is quite different from the flight of birds or insects or the fluttering of a bat, and more closely resembles the leaping movements made through the air by the Flying Squirrels or the Flying Lizards (Dragons). By the help of the large and strong lateral muscles of the body the fish attains the speed of an arrow, which it mantains above the water, slackening, of course, towards the end, and thus traverses a distance of from 100 to 150 metres through the air in less than 20 seconds. At the same instant as it leaves the surface of the water, the pectoral and ventral fins are expanded. It supports itself principally on the former fins, but almost passively, the wind and pressure of the atmosphere bearing the fish along without any exertion on its own part, save that needed to keep these fins expanded. There is no independent motion of these fins, according to Möbius; but when the wind blows in a direction exactly parallel to their plane, the hind margin flutters, like the sails of a boat in stays. The Flying-fish cannot steer an independent course, according to Möbius, the direction of its flight being fixed by the impetus once gained; and when the speed

slackens, we may see its course changed by the wind, when the latter is not dead ahead, for some seconds before the fish falls back into the waves. According to Möbius the fish is hardly able to rise or descend at will, and when it is seen moving up and down along the waves, this is probably nothing more than the effect of the current of air that rises from the surface, and is formed in the trough of the waves just as a stream eddies when it passes a promontory, or from the same cause as that from which the flame of a candle is attracted towards a surface, if we blow straight towards that surface through a tube, the end of which is beside, but behind the candle.

"In many cases fear is probably the first cause of the aerial flight of the Flying-fish; as we have just observed with respect to the Saury, the Flying-fish also seeks refuge in the air from its pursuers, especially the Dolphin-fishes (Coryphaena) and Bonitos, or sometimes springs up in terror before the bow of a vessel under way. Often, however, this habit is due to the same instinct that impels the Garpike to leap out of the water as if in sport; and like other fishes that are closely packed in shoals, they often leap in order to escape the crush or to pass one another. They appear on the wing oftener in stormy weather or a steady breeze than in a dead calm. They generally keep only a few feet above the surface; and when they rise higher, as in the cases where they have fallen in the deck of a vessel as much as 5 metres above the water, this is also due, says Möbius, to the influence of the air-currents. The Flying-fish always come on board on the windward side in a fresh breeze and, in most cases, at night, when in spite of their large eyes they cannot see the ship and avoid it. On the widward side of vessels that have sailed during the night through some part of the ocean where Flying-fish abound, spots of blood and the scales of Flying-fish are often found in the morning; and when the sailors swab the decks, they sometimes come across no small numbers of Flying-fish, a welcome and agreeable change in the seamen's fare. Some of the Flying-fish have thus been dashed against the vessel's side in their rapid flight and killed; but others have been borne over the bulwarks by the current of air that rushes up the widdward side of the vessel, and have fallen on deck."

(Smitt.)

Analysis of Genera

a^1. Oxyporhamphinae. Pectoral short, not reaching ventral; lower jaw prominent, with symphyseal point, as distinct beak in young.---------- Oxyporhamphus.

a^2. Exocoetinae. Pectoral longer, reaching dorsal or caudal; lower jaw not prominent.

b^1. Teeth on tongue; scales large, less than 40; pectoral moderate; ventral shorter than head.--- Parexocoetus.

b^2. No teeth on tongue or vomer, present or absent on palatines; scales more than 40; pectoral longer, nearly reaches caudal.

c^1. Ventral much shorter than head, inserted much nearer snout than caudal base.-------- Exocoetus .

c^2. Ventral long as or longer than head, inserted much nearer caudal than snout.---------- Cypselurus.

Genus Oxyporhamphus Gill

Oxyporhamphus GILL, Proc. Acad. Nat. Sci. Philadelphis, 1863, p. 273. (type Hemiramphus cuspidatus VALENCIENNES, orthotypic.)

Evolantia SNODGRASS and HELLER, Proc. Washington Acad. Sci., vol. 5, p. 189, 1903. (Type Exocoetus micropterus VALENCIENNES monotypic.)

Body elongate, well compressed. Head small, rather pointed. Snout short. Eye advanced. Mandible with distinct symphyseal point, protrudes in front; in fry without beak to lower jaw, later formed as temporary beak of 2 slender persistent rods, these breaking off at an early age to leave finally only spot like scar on chin. Teeth small, conic, pointed, simple, irregularly biserial in jaws and none on palate or tongue, Gill rakers lanceolate, finely spinescent on front edges. Scales moderate. Lateral line low. Dorsal begins before or opposite anal, subequal with same. Pectoral short, not reaching ventral. Ventral inserted nearer caudal base than eye, broad.

One species. The temporary beak of the young is formed of 2 slender extended rods from the mandible; apparently breaking through the skin, later breaking off and the skin either free as a pair of barbels, also likely temporary or healing at the chin. The beak forms in examples of 20 to 75 mm. in length, or only as sharp mandibular point in very young or fry.

Oxyporhamphus argenteus (F. D. Bennett)

Hemiramphus argenteus F. D. BENNETT, Narrative Whaling Voy., vol. 2, p. 269, woodcut, 1840 (type locality: lat. 3° S., lat. 5° N., Pacific Ocean). --CASTELNAU, Proc. Linn. Soc. New South Wales, vol. 3, p. (355) 394, 1878 (Port Jackson). --FOWLER, Mem. Bishop Mus., vol. 10, p. 78, 1928 (note; compiled).

Hemirhamphus argenteus MC CULLOCH, Fishes New South Wales, ed. 2, p. 31, 1927 (doubts Port Jackson record); Austral. Mus. Mem., no. 5, pt. 1, p. 103, June 29, 1929 (compiled; part).

Hemiramphus cuspidatus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 56, 1846 (type locality: from stomach of bonito taken in East Indies).

Hemirhamphus cuspidatus GILL, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 273 (reference).

Exocoetus micropterus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 127, pl. 563, 1846 (type locality: Port King George, New Holland; Carteret, New Ireland; Buru; Malabar). --BLEEKER, Verh. Batavia. Genoot. (Nal. Ich. Bengal. Hind.), vol. 25, p. 72, 1853 (reference); Act. Soc. Sci. Ind. Nêerland , vol. 1, no. 5, p. (7) 63, 1856 (Amboina). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (Amboyna). --BLEEKER, Atlas Ichth. Nêerland Indië, vol. 6, p. 77, 1866-72 (Amboina).

--SCHMELTZ, Cat. Mus. Godeffroy, no. 4, p. 25, 1869 (Savay). --LÜTKEN, Vidensk. Medd. naturh. Foren. Kjöbenhavn, p. 396 (103), 1876 (Atlantic Ocean, lat. 11° N., long. 26° W.; lat. 31° N., long. 76°W,). --DAY, Fishes of India, pt. 3, p. 518, 1877. --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 185, 1881 (copied). --DAY, Fauna British India, Fishes, vol. 1, p. 429, 1889. --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 361, 1909 (Indian Archipelago, New Mecklenburg, Savaii, Hawaiian Islands).

Cypsilurus micropterus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 128, 1865 (Amboina); Atlas Ichth. Indië Néerland, vol. 6, pl. (3) 269, fig. 1, 1866-72.

Evolantia microptera SNODGRASS and HELLER, Proc. Washington Acad. Sci., vol. 5, p. 189, 1903 (lat. 4° N., long. 90° W.). --JENKINS, Bull. Bur. Fisher., vol. 22, p. 434, 1902 (1903) (Honolulu). --SNODGRASS and HELLER, Proc. Washington Acad. Sci., vol. 6, p. 351, 1905 (copied). --JORDAN and EVERMANN, Bull. Bur. Fisher., vol. 23, pt. 1, p. 130, fig. 44, 1903 (1906) (Honolulu). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 10 (Revillagigedos). --FOWLER and BALL, Bull. Bishop Mus., no. 26, p. 8, 1925 (Laysan). --FOWLER, Mem. Bishop Mus., vol. 10, p. 80, 1928 (Kingsmills; Phoenix Islands).

Evolantia micropterus WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 176, fig. 61, 1922 (unknown locality).

Exocetus kuag THIOLLIÈRE, Faune Woodlark, p. 205, 1857 (type locality: Woodlark Island).

Hemirhamphus convexus WEBER and BEAUFORT, Fishes Indo Austral. Arch., vol. 4, p. 159, fig. 57 (head), 1922 (type locality: Timor; between Gêbe and Fau).

Depth 5 2/3 to 7 in body from snout tip; head 4 1/5 to 4½, width 2¼ to 3 1/8. Shout 3½ to 4 1/8 in head from snout tip; eye 3 3/4 to 4, subequal with eye, little greater than interorbital; maxillary reaches 3/4 to eye, length 4 2/5 to 5 in head from snout tip; young 80 to 90 mm. with mandibular beak, which measured beyond lower jaw tip 5 times to caudal base, each side also furnished with well developed broad cutaneous flap; interorbital 3 1/4 to 4, low, nearly or quite level. Gill rakers 8 + 21, ½ of gill filaments, which 1½ in eye.

Scales 40 to 44 in median lateral series to caudal base and 3 or 4 more on latter; 7 above lateral line to dorsal origin; 33 or 34 predorsal. Scales with 2 or 3 basal radiating striae, edge scalloped; circuli 30 to 35, more or less complete.

D. I, 12, I or I, 13, I, eighth ray 1 3/4 to 2 in head from snout tip; A. I or II, 10, I to I, 14, I, first branched ray $2\frac{1}{2}$ to 2 3/5; least caudal peduncle 3 3/4 to 4; P. I, 9, fin 1 1/3 to 1 4/5 to ventral or $3\frac{1}{4}$ to 4 1/8 in space from snout tip to caudal base; ventral 1 2/3 to 2 in head from snout tip.

Back brown, sides and below silvery white. Broad gray blue leaden shade or sheen from shoulder to caudal base medially. Iris silvery white. Young with beak black. Dorsal whitish, dusky above anteriorly and posteriorly above black. Caudal dark brown, whitish in young. Anal white, posteriorly black, latter area often more extensive in young. Pectoral whitish, terminally dusky to dark brown. Ventral whitish, hind tips blackish.

India, East Indies, Australia, Melanesia, Polynesia, Hawaii, Revillagigedos. There is little doubt but that the crude figure and description by Valenciennes for his Hemiramphus cuspidatus is based on a young example of the present species. His specimens were a little over 100 mm. The fins are given as "D. 18; A. 12, etc." The young specimens from Timor and between Gêbe and Fau described and figured by Weber as a species of Hemiramphus in 1913 and later named Hemiramphus convexus by Weber and Beaufort appear to be synonymous with the present species.

The following is Bennett's account of Hemiramphus argenteus:

"This fish is chiefly remarkable for possessing a prolongation of the lower jaw, in the form of a slender, black, and pointed bone, similar in form, and apparently in office, to the beak, or rostrum, continued from the upper jaw of the sword-fish.

"Average length of the species 4 inches. Body long and compressed. Colour, uniformly silver-white; iris silvery. Pectoral fin long and slender; dorsal and anal placed far back and opposite each other.

"Taken near the surface of the sea, in lat. 3° S. and 5° N., Pacific Ocean."

Curiously Bennett's figure does not show the beak black, such a conspicuous feature in preserved examples.

11 examples. Jolo, Jolo Island. Electric Light. February 8, 1908. Length 61 to 82 mm. All have complete beaks, black and with black lateral flaps.

19863. Maculabo Island. Electric Light. June 13, 1909. Length 86 mm.

One example. Nogas Point, Panay. February 3, 1908. Length 75 mm. Beak to eye equals rest of head.

One example. Taal Anchorage. Electric Light. February 20, 1909. Length 92 mm. Beak projects beyond snout for space equal to $\frac{1}{2}$ eye.

One example. Tataan Passage. February 20, 1908. Length 116 mm.

D. 5604. Bilatu (town), N. 26° W., 8. 7 miles (lat. 0° 22' 30" N., long. 122° 42' 30"E.), Gulf of Tomini, Celebes. November 15, 1909. Length 66 mm. (beak broken).

A. N. S. P., no. 16000. From stomach of Gannet taken 150 miles south of Rivellagidedos. June 1875. Dr. W. H. Jones.

Genus Parexocoetus Bleeker

Parexocoetus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 126, 1866. (Type Exocoetus mento VALENCIENNES, monotypic.)

Body moderately ong, elliptical in cross section, compressed. Snout short. Eye large. Jaws protractile, lower with symphyseal knob projecting beyond upper jaw. Teeth minute, conic, in few rows, in jaws, on vomer, palatines, pterygoids and tongue. Gill rakers lanceolate. Scales large. Lateral line low. Dorsal high, opposite anal. Anal long as dorsal, lower. Pectoral moderate, not reaching beyond middle of dorsal. Ventral short, not reaching anal, insertion median or little postmedian.

Parexocoetus brachypterus (Richardson)

Exocoetus brachyopterus RICHARDSON, Ichth. China Japan, p. 265, 1846 (type locality: Tahiti). --STEINDACHNER, Denks. Akad. Wiss. Wien, mat. -nat. Klu, vol. 70, p. 512, 1900 (Honolulu; Laysan).

Exocoetus brachiopterus (SOLANDER) VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 131, 1846 (Tahiti; name in text).

Exocoetus brachypterus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 280, 1866 (China Seas). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference). --STREETS, Bull. U. S. Nat. Mus., no. 7, p. 75, 1877 (Hawaiian Islands). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 362, 1909 (Pelew Islands; Port Mackay; Tahiti).

Exocaetus brachipterus ELERA, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Samar; Borongan).

Parexocoetus brachypterus JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu). --SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904) (off Molokai). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 131, pl. 3, 1903 (1905) (Honolulu; Hilo). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 10 (Hawaiian Islands); Copeia, no. 122, p. 82, Nov. 22, 1920 (Hawaii). --WEBER and BEAUFORT, Fishes Indo Austral. Arch., vol. 4, p. 174, fig. 60, 1922 (Simalur; Nias; Batavia, Samarang and Panarukan, Java; Java Sea; Sunda Strait; Makassar, Celebes; between Fau and Gebe; Flores; Timor; Adonare). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 202 (Natal). --FOWLER and BALL, Bull. Bishop Mus. 26, p. 8, 1925 (Lahaina, Maui) --WHITLEY, Rec. Austral. Mus., vol. 14, no. 1, Oct. 7, p. 10, 1927 (Michaelmas Cay, Queensland). --FOWLER, Mem. Bishop Mus., vol. 10, p. 79, 1928 (Honolulu, Lahaina, Maui, Oahu). --BORODIN, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 46, 1930 (Ponapé, Carolines; Cebu Harbor). --FOWLER, Hong Kong Nat., vol. 3, nos. 3-4, p. 272, fig 16. Dec.1932 (Hawaii,Atlantic).

Exonautes brachypterus CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

? Exocoetus javanicus VAN HASSELT, Bull. Sci. Nat. Géol. Férussac, vol. 2, p. 375, 1824 (type locality: Batavia, Java).

Exocoetus brevipinnis VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 123, 1846 (type locality: Carteret Harbor, New Ireland). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 280, 1866 (copied); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 362, 1909 (New Mecklenburg).

Exocoetus mento VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 124, 1846 (type locality: Pondicherry). --BLEEKER, Verh. Batavia, Genoot. (Snoek.), vol. 24, p. 21, 1852 (Batavia); Nat. Tijds. Nederland Indië, vol. 3, pp. 718, 722, 1852 (Tandjong Berikat, Banka); vol. 4, p. 133, 1853 (Ternate); Verh. Batavia. Genoot. (Nal. Ich. Bengal. Hind.), vol. 25, p. 72, 1853 (Pondicherry); Nat. Tijds. Nederland Indië , vol. 20, p. 141, 1859-60 (Badjoa, Boni). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 281, 1866 (Indian Seas); Fishes of Zanzibar, p. 117, 1866 (Zanzibar). --SCHMELTZ, Cat. Mus. Godeffroy, no. 6, p. 18, 1877 (Pelew Islands). --DAY, Fishes of India, pt. 3, p. 520, pl. 131, fig. 9 1877. --MEYER, Anal. Soc. Espan. Hist. Nat. Madrid, vol. 14, p. 39, 1885 (Rubi, New Guinea).

Exocaetus mento GORGOZA, An. Soc. Españ. Hist. Nat. Madrid, vol. 14, p. 73, 1885 (Comprado).

Exococtus mento OGILBY, Proc. Linn. Soc. New South Wales, vol. 4, p. 64, 1879 (Solomons).

Parexocoetus mento BLEEKER, Atlas Ichth. Ind. Nêerland, vol. 6, p. 77, pl. ( ) 251, fig. 6, 1866-72 (Java, Banka, Celebes, Ternate). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1905, p. 494, 1905 (Baram, Borneo). --JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, p. 9, 1906 (1907) (Cavite). --JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, p. 243, 1907 (1908) (Manila). --WEBER, Siboga Exped., vol. 57, Fische, p. 128, 1913 (between Gebe and Fau). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 267, June 1925 (Durban Bay; Delagoa Bay).

Exocoetus hillianus GOSSE, Natural. Sojourn Jamaica, p. 11, 1851 (type locality: Jamaica). --LÜTKEN, Vidensk. Medd. naturh. Foren. Kjöbenhavn, p. 397 (104), 1876 (Honolulu). --NORMAN, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 320, April 1922 (Natal).

Exocoetus rostratus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 280, 1866 (type locality: Hawaiian Islands); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 363, 1909 (type).

Parexocoetus rostratus JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 131, 1903 (copied).

Exocoetus atrodorsalis GÜNTHER, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 67, 1867 (type locality: Cape York); Zool. Record, Pisces, p. 109, 1871 --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 188, 1881 (Cape York).

Exocoetus gryllus KLUNZINGER, Verh. Zool. bot. Gesell. Wien, vol. 21, p. 146, 1871 (type locality: Red Sea).

Parexocoetus mesogaster (not BLOCH) JORDAN and MEEK, Proc. U. S. Nat. Mus., vol. , p. 47, 1885 (Hawaiian Islands). --JORDAN and EVERMANN, Bull. U. S. Nat. Mus., no. 47, pt. 1, p. 728, 1896 Hawaiian Islands). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 500 (Hawaiian Islands). --SEALE, Occas. Pap. Bishop Mus., vol. 1, no. 5, p. 17, 1902 (Honolulu). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 267, June 1925 (Natal; pt. 2, p. 1022, Oct. 1927 (Fowler's reference).

Depth 4 3/5 to 5; head 4 to 4 1/5, width 2 to 2 1/8. Snout 3 3/4 to 3 4/5 in head from snout tip; eye 2 4/5 to 3, greater than snout, subequal with interorbital; maxillary not quite reaching eye, length 4 in head from snout tip; interorbital 2 4/5 to 3, low level. Gill rakers 8 + 19, lanceolate.

Scales 38 or 39 in lateral axial series to caudal base; 6 above, predorsal. Scales with 4 or 5 basal radiating striae; circul fine, complete.

D. II, 9, I, first branched ray 3 3/5 in combined head and body to caudal base; A. I, 11, I or I 12, I, first branched ray 2 2/5 to $2\frac{1}{2}$ in total head length; ventral 1 1/5 to $1\frac{1}{4}$, origin midway between snout tip and caudal base; caudal $3\frac{1}{2}$ to 3 3/5 in combined head and body to caudal base; pectoral rays I, 12, fin 1 4/5 to 2, reaches middle of dorsal base.

Back dark neutral gray, below whitish. Dorsal white, large blackish blotch anterior and terminal. Lower caudal lobe deep gray medially. Pectoral dusky gray, edge above and below whitish. Ventral and anal white.

Red Sea, Zanzibar, Portuguese East Africa, Natal, India, East Indies, Philippines, China, Queensland, Melanesia, Micronesia, Polynesia, Hawaii. The reference to Exocoetus javanicus Van Hasselt, though without description likely applies to this species. It is said to approach Exocoetus mesogaster Bloch, but differs in the number of dorsal rays.

24140 to 24142. Alimango Bay, Burias Island. Gill nets. March 6, 1909. Length 125 to 130 mm.

Three examples. Balayan Bay, Luzon. Janurary 19, 1908. Length 90 to 104 mm.

Two examples. Bolinao, Luzon. Electric light. May 9, 1909. Length 49 to 67 mm.

One example. Caldera Bay. Electric light. February 16, 1908. Length 21 mm.

Three examples. Capulaan Bay, Pagbilao Island. Electric light. February 23, 1909. Length 83 to 89 mm.

9098, 9099. Catbalogan, Samar. April 15, 1908. Length 109 to 125 mm. Six examples.

7772, 7774 to 7775. Catbalogan. April 17, 1908. Length 113 to 125 mm.

Three examples. Cebu. Electric Light. March 13, 1909. Length 40 to 85 mm.

4413. D. 5226. Corregidor Light, N. 10° E., 10.70 miles (lat. 14° 12' 15" N., long. 120° 32' 24" E.), China Sea. May 4, 1908. Length 155 mm.

Three examples. Iloilo market. March 28, 1909. Length 41 to 72 mm.

Twenty-one examples. Julo. Electric light. February 7, 1908. Length 93 to 124 mm.

Fifty-two examples. Jolo. February 8, 1908. Length 14 to 139 mm.

One example. Jolo. February 14, 1908. Length 24 mm.

Six examples. Maculabo Island. June 13, 1909. Length 86 to 101 mm.

Six examples. Manila markets. December 12 to 18, 1907. Length 92 to 127 mm.

9079. Manila market. June 24, 1908. Length 104 mm.

Three examples. Masbate, Masbate Island. Electric light. April 20, 1908. Length 22 to 35 mm.

Three examples. Murcielagos Bay, Mindoro. August 20, 1909. Length 75 to 124 mm.

One example. Nasugbu, Luzon. Electric light. Janurary 15, 1908. Length 23 mm.

Two examples. Nogas Point, Panay. February 31, 1908. Length 103 to 123 mm.

5363. Oton market, Jolo. March 30, 1908. Length 98 mm.

One example. Philippines. Length 107 mm.

Two examples. Port Langcan, eastern Palawan. April 7, 1909. Length 34 to 38 mm.

One example. Santa Cruz, Marinduque. Electric light. April 23, 1908. Length 19 mm.

11421. Sea off Capones Island. November 23, 1908. Length 157 mm.

D. 5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" E. 121° 1' 15" E.), vicinity Jolo Island. September 19, 1909. Length 25 to 76 mm.

Two examples. Tumindao Island. Electric light. February 25, 1908. Length 58 to 72 mm.

One example. Sandakan Anchorage, Borneo. March 1, 1908. Length 52 mm. Electric light.

U. S. N. M. No. 17986. Honolulu. Dr. T. H. Streets. Length 158 to 170 mm. Two examples.

U. S. N. M. No. 55118. Honolulu. Albatross Collection. June 27, 1902. Length 170 to 180 mm. Six examples.

U. S. N. M. No. 55123. Honolulu. Albatross Collection. April 6, 1902. Length 155 to 180 mm. Seven examples.

U. S. N. M. No. 55432. Honolulu. 1901. Bureau of Fisheries. Length 170? to 178? mm. Five examples.

U. S. N. M. No. 55559. Length 163 to 182 mm. Two examples.

U. S. N. M. No. 58524. Honolulu. E. L. Berndt. Bureau of Fisheries. Length 160 mm.

U. S. N. M. No. 63631. Honolulu. E. L. Berndt. Bureau of Fisheries. Length 160? mm.

U. S. N. M. no. 72564. Batavia, Java. April 2, 1909. O. Bryant and W. Palmer. Length 82 mm.

U. S. N. M. no. 75466. Nafa, Okinawa. Albatross Collection 1906. Length 144 to 147 mm. Five examples.

U. S. N. M. no. 76648. Takao, Formosa. Dr. Fred Baker. Length 58 to 70 mm. Three examples. As Cypsilurus nigripinnis. Dorsal and paired fins terminally blackish.

U. S. N. M. no. 84081. Hawaii. Length 140? mm. Poor.

A. N. S. P., no. 7482. Hawaiian Islands. Dr. J. K. Townsend. Length 148? mm.

A. N. S. P., no. 51339. Madras, India. 1922. Department of Fisheries of Bengal. Length 116 mm.

A. N. S. P., 1 example. Boram, British North Borneo. 1898. Dr. W. H. Furness 3rd. Wistar Inst. Anatomy. Length 126 mm.

A. N. S. P., 2 examples. Natal, South Africa. Mr. H. W. Bell - Marley. Length 128 to 142 mm.

Genus Exocoetus Linnaeus

Exocoetus LINNAEUS, Syst. Nat., ed. 10, pt. 1, p. 316, 1758.

(~~ty~~pe, Exocoetus volitans LINNAEUS, monotypic.)

Exoeetus BONNATERRE, Tabl. Ichth., p. 181, 1788. (Type, Exocoetus volitans LINNAEUS.)

Exocaetus LACÉPÈDE, Hist. Nat. Poiss., vol. 5, p. 401, 1803. (Type, Exocoetus volitans LINNAEUS.)

Exococtus SCHLEGEL, Fauna Japonica, Poiss., pts. 10-14, p. 247, 1846. (Type, Exocoetus volitans LINNAEUS.)

Halocypselus WEINLAND, Proc. Boston Soc. Nat. Hist., vol. 6, p. 385, 1859. (Type, Exocoetus mesogaster (not Bloch) = Exocoetus volitans Linnaeus, orthotypic.)

Body moderately long, cross section partly quadrate, compressed. Head moderate. Snout short, blunt. Eye large. Lower jaw but little projecting. Teeth very samll, inconspicuous, present or absent on vomer and palatines, none on pterygoids, Gill rakers lanceolate. Scales rather large. Lateral line low. Dorsal not elevated. Anal opposite dorsal and nearly as long. Pectoral very long, reaches caudal base. Ventral premedian, nearer snout than caudal, short, not reaching anal base.

Exocoetus volitans Linnaeus

Exocoetus volitans LINNAEUS, Syst. Nat., ed. 10, pt. 1, p. 316, 1758 (type locality: pelagic in high seas of Europe and America); ed. 12, pt. 1, p. 520, 1766. --FORSKÅL, Descript. Animal., p. XVI, 1775 (Djedda; Moccha). --GMELIN, Syst. Nat. Linn., pt. 1, p. 1399, 1788. --WHITE, Journ. Voy. New South Wales, p. 295, pl. (opposite p. 266), 1790. --WALBAUM, vol. 3, p. 49, 1792 (copied). --FORSTER, Fauna Indica, p. 16, 1795 (on Bloch pl. 67). --BLUMENBACH, Handb. Naturg., p. 286, 1799. --LICHTENSTEIN, Descr. Animal. Forster, p. 155, 1844 (tropical Pacific). --G. BENNETT, Gatherings Nat. Australia, p. 13, 1861 (Australian coast). --LÖNNBERG, Bih. Svensk. Akad., Stockholm, vol. 22, no. 1, p. 25, 1896 (type specimen). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 500 (Hawaii). --BRYAN and HERRE, Occas. Pap. Bishop Mus., vol. 2, no. 1,

p. 127, 1902 (1903) (Marcus Island). --JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu; N. 28° 3' W. 143° 10'). --SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904) (lat. 24° N., long. 151° W.; near Oahu). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 132 (not fig. 45), 1903 (1905) (lat. 28° 34' 2" N., long. 143° 10' 5" W.). --SEALE, Occas. Pap. Bishop Mus., vol. 4, p. 15, 1906 (Tahiti). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1907, p. 424 (Victoria, Australia); 1910, p. 10 (types of Exocoetus chilensis, Indian Ocean, Hawaiian Islands, Victoria). --FRANZ, Abhandl. Bayer. Akad. Wiss., vol. 4, Suppl. band 1, p. 24, 1910 (Yokohama). --KENDALL and RADCLIFFE, Mem. Mus. Comp. Zool., vol. 35, p. 85, 1912 (lat. 0° to 7° S., long. 82° to 102° W.). --WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 177, fig. 62, 1922(Java;Java Sea;West of Saleyer). --FOWLER, Copeia,

no. 122, p. 82, Nov. 20, 1922 (Hawaii). --FOWLER and BALL, Bull. Bishop Mus. 26, p. 8, 1925 (Wake Island 180th meridian). --FOWLER, Bull. Bishop Mus., no. 38, p. 7, 1927 (Central Pacific); Mem. Bishop Mus., vol. 10, p. 80, fig. 16 (young); 1928 (Honolulu; between Sunday Island and Tonga; open Pacific; Marcus Island; lat. 10° N., long. 160° W.; off Wake Island; 180th meridian; Hawaiian Islands); Hong Kong Nat., vol. 3, nos. 3-4, vol. 11, no. 5, p. 319, 1931 (compiled; p. 273, fig. 17, Dec. 1932 (Australia, Polynesia, Hawaii, Atlantic). Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (lat. 3° S., long. 108° W.; lat. 2° 10' N., long. 86° W.; 100 miles east of Tahiti).

Exocetus volitans BONNATERRE, Tabl. Ichth., p. 181, pl. 73, fig. 306, 1788 (Europe; America). --SWAINSON, Nat. Hist. Animals, vol. 2, p. 296, 1839 (on Bloch pl. 398).

Exocaetus volitans LACÉPÈDE, Hist. Nat. Poiss., vol. 5, pp. 401, 402, pl. 12, fig. 2, 1803 (all seas). --JOUAN, Mem. Soc. Sci. Nat. Imp. Cherburg, vol. 9, p. 191, 1863 (between New Caledonia and Tahiti). --ELERA, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Luzon; Manila; Cebu; Samar).

Exocoetus evolans LINNAEUS, Syst. Nat., ed. 12, pt. 1, p. 521, 1766 (type locality: Oceano Hispanico) (on Grenow). --GMELIN, Syst. Nat. Linn., pt. 1, p. 1400, 1789 (copied). --WALBAUM, Artedi Pisc., vol. 3, p. 49, 1792 (copied). --BLOCH, Naturg. Ausl. Fische, vol. 9, p. 14, pl. 398, 1795 (Cape of Good Hope). --SHAW and NODDER, Nat. Miscellany, vol. 12, pl. 446, 1800 (Mediterranean; Atlantic). --SCHNEIDER, Syst. Ichth. Bloch, p. 430, 1801 (copied). --VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 138, 1846 (Ceylon; Bourbon;

Arabia; Minicoi; Carteret; Mauritius; New Zealand; Australia; Tongatabu). --GRAY, Cat. Fish Gronow, p. 145, 1854 (Spain; America). --BLEEKER, Naturk. Tijds. Nederland Indië, vol. 21, p. (51, 56) 76, 1860 (Cape of Good Hope). --GUICHENOT, Notes Ile Réunion, vol. 2, p. 29, 1862; ser. 2, vol. 2, p. 147, 1866 (Madagascar). --KNER, Reise Novara, Fische, p. 326, 1865 (no locality). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 282, 1866 (Zanzibar, Seychelles; Java; India; China; North Australia). --STEINDACHNER, Sitzs. Ber. Akad. Wiss. Wien, math. - nat. Kl., vol. 53, pt. 1, p. 470, 1866 (Port Jackson). --BLEEKER, Atlas Ichth. Indië Néerland, vol. 6, p. 69, 1866-72 (Java). --JOUAN, Mém. Soc. Sci. Imp. Cherbourg, ser. 2, vol. 5, p. 106, 1870 (Seychelles). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference). --LÜTKEN, Vidensk. Medd. naturh. Foren., Kjobenhavn, p. 395 (102), 1876 (Gulf of Mexico; St. Barthélemy). --DAY, Fishes of India, pt. 3, p. 519, pl. 120, fig. 5, 1877

(Bombay, Andamans). --MACLEAY, Proc. Linn. Soc. New South Wales, ser. 2, vol. 5, p. 186, 1881 (North Australia). --PÖHL, Cat. Mus. Godeffroy, no. 9, p. 38, 1884 (South Seas). --BOULENGER, Proc. Zool. Soc. London, 1887, p. 666 (Muscat.). --DAY, Fauna British India, Fishes, vol. 1, p. 429, 1889. --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). --STEAD, Fishes of Australia, p. 71, 1906. --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 363, 1909 (Tahiti; Samoa; Kingsmills). --FRANZ, Abhandl. Akad. Wiss. München, Suppl. Band, vol. 4, pt. 1, p. 24, 1910 (Yokohoma). --WEBER, Siboga Exped., vol. 57, Fische, p. 124, 1913 (lat. 6° 19' S., long. 119° 52' E.). --MC CULLOCH, Fishes New South Wales, ed. 2, p. 30, pl. 10, fig. 106, 1927. --CHU, Biol. Bull St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Exocetus evolans BONNATERRE, Tabl. Ichth., p. 182, pl. 100, fig. 409, 1788 (Meditteranean).

Exocaetus evolans DE VIS, Proc. Linn. Soc. New South Wales, vol. 8, p. 451, 1883 (New Britain). --ELERA, Cat. Fauna, Filip. vol. 1, p. 57, 1895 (Luzon; Cavite; Santa Cruz).

Halocypselus evolans JORDAN and MEEK, Proc. U. S. Nat. Mus., vol. , p. 49, 1885 (type of Exocoetus chilensis; Indian Ocean; Hawaii). --NICHOLS, Ann. Mus. Novit., no. 94, p. 3, Oct. 19, 1923 (Ducie Island). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 268, pl. 10, fig. 7, June 1925 (copied) (Cape Seas).

Exocoetus splendens ABEL, Narr. Voy. China, p. 4, 1818 (type locality: China).

Exocaetus volans RICHARDSON, Ichth. China Japan, p. 264, 1846 (type locality; Seas of China; Polynesia). --SAVILLE KENT, Great Barrier Reef, pp. 299, 370, 1893 (Queensland).

Exocoetus apus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 107, 1846 (type locality: Seas of China near Macao).

--BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference) --CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, 1931 (reference).

Exocaetus apus ELERA, Cat. Fauna Filip., vol. 1, p. 476, 1895 (Luzon; Manila; Navotas).

Exocoetus georgianus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 136, 1846 (type locality: lat. 5° N., long. 92° W.).

GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (copied).

--LÜTKEN, Vidensk. Medd. naturh. Fören., Kjobenhavn, p. 394, 1876 (between Hawaii and Japan in lat. 31° S., long. 47° E.).

Exocaetus monocirrhus RICHARDSON, Ichth. China Japan, p. 265, 1846 (type locality: Sea of China). --ELERA, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Luzon; Cavite; Santa Cruz).

Exocoetus monocirrhus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (copied). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference).

Exonautes monocirrhus CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference)

Exocoetus chilensis ABBOTT, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 472 (type locality: Chile).

Exocoetus obtusirostris GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 283, 1866 (type locality: Cape Verde Islands; India; New Orleans). --BLEEKER, Verslag. kon. Med. Akad. Wet. Amsterdam, vol. 18, p. 3, 1879 (Shanghai) --KÁROLI, Termesz. Füzetek. Budapest, vol. 5, p. 182, 1881 (Canton). --PÖHL, Cat. Mus. Godeffroy, no. 9, p. 38, 1884 (South Sea). --CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Halocypselus obtusirostris NICHOLS and BREDER, Amer. Mus. Novit., New York, no. 561, p. 1, Sep. 16, 1932 (reference).

Exocoetus melanopus GÜNTHER, Ann. Mag. Nat. Hist., ser. 4, vol. 1, p. 459, 1868 (type locality: Zanzibar; New Pomerania).

--GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 366, 1909 (types; New Pommerania).

Exocoetus speculiger (not VALENCIENNES) STREETS, Bull. U. S. Nat. Mus., no. 7, p. 75, 1877 (Honolulu).

Exocaetus longibarba DE VIS, Proc. Linn. Soc. New South Wales, vol. 8, p. 454, 1884 (type locality: New Britain).

Halocypselus borodini NICHOLS and BREDER, Amer. Mus. Novit., New York, no. 561, p. 1, fig. 1, Sep. 16, 1932 (type locality: Mauritius).

Depth 4 3/4 to 6 1/5; head 3 2/5 to 4, width 1 4/5 to 2. Snout 3 3/4 to 5 in head from snout tip; eye 2 2/3 to 4 1/8, greatly exceeds snout, 1 1/8 to $1\frac{1}{4}$ in interorbital; maxillary reaches 4/5 to eye, length 3 2/3 to 4 3/4 in head from snout tip; interorbital $2\frac{1}{2}$ to 3 1/5, low, flat. Gill rakers 7 to 9 + 20 to 27, slender, $1\frac{1}{4}$ in gill filaments, which $1\frac{1}{4}$ to 1 2/5 in eye.

Scales 38 to 47 in axial lateral series to caudal base and 3 or 4 more on latter; 7 above, 2 below, 26 to 30 predorsal. Scales with 3 to 5 basal radiating striae; circuli fine, complete.

D. II, 11 to II, 13, first branched ray 2 to 2½ in total head length; A. I, or II, 11 or I, 12, first branched ray 2¼ to 2 1/3; least depth of caudal peduncle 3 2/3 to 3 4/5; ventral 1 4/5 to 2, inserted midway between snout tip and last anal ray base; upper cuadal lobe 1 2/5 to 1½ in lower lobe, which 3 ½ to 3 3/5 in rest of fish; pectoral 1 1/3 to 1 2/5, reaches to or slightly beyond caudal base.

Above olivaceous, tinted with dusky, sides and below silvery white. Iris silvery white. Vertical fins dusky, though anal with basal band, broader in front. Pectoral dark above, lower edges white. Young with 2 dark cross bands and sometimes small barbel at chin.

Widely distributed in most all tropical or warm seas, as the Atlantic, Indian and Pacific Oceans.

One example. D. 5195. Capitancillo Island Light, N., 11. 75 miles (lat. 10° 47' N., long. 124° 6' 30" E.), off northern Cebu. April 3, 1908. Length 26 mm.

11420. Sea off Capones Island. Flew on board during evening. November 23, 1908. Length 190? mm.

One example. Jolo. February 7, 1908. Length 81 mm.

U. S. N. M., no. 2501. Lat. 44° 27' N., long. 60° 20' 15" W. (off Nova Scotia). July 7, 1885. Length 245 mm.

U. S. N. M., no. 4809. Length 175 mm. Very poor condition.

U. S. N. M., no. 50013. Lat. 21° N., long. 116° W., R. E. Snodgrass and E. L. Heller. Length 59 to 200 mm. Four examples. Young with single mandibular barbel 1½ in total head length. As Halocypselus evolans.

U. S. N. M., no. 55171. Albatross Collection (2492). Length 253 mm.

U. S. N. M., no. 65831. Open Pacific. Albatross Collection (05809). September 8, 1899. Length 37 mm. No barbels.

U. S. N. M., no. 82243. Hawaiian region, Pacific Ocean. Carnegie Magnetic Exped. Dr. J. Hobart Egberts. Length 38 mm. No barbels.

A. N. S. P., no. 7503. Indian Ocean. Dr. R. Coates.

A. N. S. P., no. 7457. Hawaiian Islands. Dr. W. H. Jones.

A. N. S. P., no. 33150. Victoria, Australia. Mrs. Agnes F. Kenyon.

A. N. S. P., nos. 43479 and 43480. Flew aboard th "Numéra" in the tropics. Sir Ernest Shackleton. J. H. Mc Fadden.

A. N. S. P., nos. 7498 and 7499. Chile. S. S. Rand. Types of Exocoeus chilensis. Length to mm.

A. N. S. P., nos. 9458 to 9475. Lat. 10° 25' N., long. 168° 9' W. Dr. W. H. Jones.

A. N. S. P., nos. 7478 to 7480. Indian Ocean. Dr. R. Coates.

Genus Cypselurus Swainson

Cypsilurus SWAINSON, Nat. Hist. Animak, vol. 2, p. 296, 1839. (Type Exocoetus muttallii LE SUEUR = Exocoetus furcatus MILCHILL, designated by JORDAN and GILBERT, Bull. U. S. Nat. Mus., no. 16, p. 380, 1882.)

Cypselurus LOWE, Proc. Zool. Soc. London, vol. 8, 1840 (Jan. 1841), p. 38. (Type Exocoetus nuttallii LE SUEUR.)

Cyprilurus DE KAY, New York Fauna, Fishes, vol. 3, p. 231, 1842. (Type Exocoetus nuttallii Le Sueur.) (Error.)

Cheilopogon LOWE, Proc. Zool. Soc. London, vol. 8, 1840 (Jan. 1841), p. 38. (Type Cypselurus pulchellus LOWE, monotypic.)

Ptenichthys MÜLLER, Archiv Naturg., vol. 9, pt. 1, p. 312, 1843. Atypic. (Type Exocoetus furcatus MITCHILL.)

Exonautes JORDAN and EVERMANN, Rep. U. S. Fish Comm., pt. 21, p. 322, 1895 (1896). (Type Exocoetus exiliens P. L. S. MÜLLER, orthotypic.)

Ptenonotus OGILBY, Proc. Roy. Soc. Queensland, vol. 21,

p. 13, 1908. (Type Exocoetus cirriger PETERS, monotypic.)

Body elongate, mostly compressed. Head moderate or small. Snout blunt. Eyes large, advanced. Teeth very feeble, small or absent, in jaws and sometimes on palate, none on vomer, pterygoids or tongue. Gill openings wide. Gill rakers lanceolate, moderate. Lateral line low. Dorsal little or not very high, begins before or opposite anal. Anal usually shorter than dorsal. Pectoral very long, reaches to or nearly to caudal base. Ventral postmedian, nearer caudal than snout, usually long.

Tropical and subtropical seas.

Cypselurus chloropterus (Valenciennes)

Exocoetus chloropterus VALENCIENNES, Hist. Nat. Poiss.,

vol. 19, p. 109, 1846 (type locality: lat. 30° 14' S.,

long. 44° 30' W.). --BLEEKER, Naturk. Tijds. Nederland

Indië, vol. 21, p. 56, 1860 (Cape of Good Hope). --GILCHRIST,

Marine Invest. South Africa, p. 153, 1901 (name). --THOMPSON,

Marine Biol. Rep. South Africa, no. 3, p. 92, 1916 (references).

--BARNARD, Ann. South African Mus., vol. 21, pt. 1, p.

271, June 1925 (on Bleeker).

Snout narrow, short. Eye very large, $2\frac{1}{2}$ in head, equals interorbital, which little concave. D. 13; A. 9. Black above, whitish below. Pectoral pale brown. Ventral colorless. Length 165 mm.

(Valenciennes.)

South Atlantic. Valenciennes gives notes from Gay's drawing as the back blue, below silvery, dorsal, caudal and pectorals green, ventrals blue.

Cypselurus japonicus (Franz)

Exocoetus lineatus var. japonicus FRANZ, Abhandl. Bayer. Akad. Wiss.4, Suppl. Band 1, pt. 1, p. 24, 1910 (type locality: Oyama, Sagami Bay).

Cypselurus japonicus JORDAN, TANAKA, SNYDER, Journ. College Sci., Tokyo, vol. , p. 108, 1913 (Sagami Bay).

Scales 43 or 44. D. 12; A. 10. Length 310 to 410 mm.

(Franz.)

This imperfectly known nominal form is described as a subspecies of the Atlantic Cypselurus lineatus.

Cypselurus longipinnis (Castelnau)

Exocoetus longipinnis CASTELNAU, Mem. Poiss. Afrique Australe, p. 64, 1861 (type locality: Agulhas Bank, South Africa). --GILCHRIST, Marine Investig. South Africa, p. 152, 1901 (reference). --THOMPSON, Marine Biolog. Rep. South Africa, no. 3, p. 94, 1916 (references). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 271, June 1925 (Agulhas Bank).

Body elongate; head 6 in body. Eye large. Scales very large. D. 12; A. 10; lower caudal lobe over twice upper; pectoral rays 14, fin reaches caudal base, 6 times in total length; ventral rays 6, first ray short, horny, flattened, length $2\frac{1}{2}$ or less in body. Silvery white generally, back gray. Fins yellowish, ventral more whitish. Length upwards of 500 mm. (Castelnau.)

South Africa. Known from Castelnau's imperfect account.

Analysis of Species

a[1]. Exonautes. Dorsal and anal opposite or nearly so, branched rays 10 to 12.

b[1]. No barbel at chin; D. 10 or 11.

c[1]. Only first pectoral ray simple, second and following ones branched.

d[1]. Pectoral with distinct hyaline band; lower gill rakers 18. ---------- rubescens.

d[2]. Pectoral without distinct hyaline band; lower gill rakers 19.----------oxycephalus.

d[3]. Pectoral uniformly dark, edges and lowermost rays pure white.

e[1]. Lower gill rakers 15.--------- melanocercus.

e[2]. Lower gill rakers 22. ---------- cribrosus.

c[2]. First and second pectoral rays simple, third and following ones branched.

f[1]. Second pectoral ray long as first; ventral origin midway between hind eye edge and caudal base.

g[1]. Large pale blotch below and subbasally on each pectoral ---- albimaculatus.

g[2]. Pectoral without pale subbasal blotch below. ---------- rondeletii.

f². Second pectoral ray ½ longer than first ray; ventral origin midway between hind preopercle edge and caudal base ---------- exsiliens.

b². Single barbel at chin; D. 13.---------- monocirrhus.

b³. Broad skinny flap at front of each mandibular ramus, lower edge fringed.----------solandri.

a². Cypselurus. Anal origin opposite middle of dorsal base, branched rays 8 or 9.

h¹. Pectoral dark, with transverse hyaline band; caudal without white spots.

i¹. Head and body without bars.

j¹. D. 13; A. 8; ventral white, medially gray. ------- arcticeps.

j². D. 14 to 16; A. 9 to 11; terminal half of ventral and posterior half of dorsal black.--nigricans.

j³. D. 13; A. 10 or 11; dorsal and ventral uniformly dusky. ------- ---------- altipennis

i². Head and body with 6 brown cross bars.

k¹. D. 13 or 14; scales 55 to 60.---- ---------- furcatus.

k². D. 10 or 11; scales 48. -------- ---------- hexazona.

h^2. Pectoral pale above, black below; 2 white spots on lower caudal lobe basally; D. 13; scales 54 to 56 ---- ---------- hirundo.

h^3. Pectoral with rounded dark spots.

l^1. Mouth without barbels.

m^1. Predorsal scales 25 to 30--- ---------- simus.

m^2. Predorsal scales 39 or 40.-- ---------- spilopterus.

l^2. Two barbels at corner of mouth ----------bilobatus.

h^4. Pectoral without bands or spots.

n^1. No barbels.

o^1. Teeth on palatines.

p^1. Ventral origin nearer gill opening that caudal.

q^1. A. 8 or 9; scales 42 to 45; dorsal uniformly pale; lower gill rakers 13 to 16.--------unicolor.

q^2. A. 10 or 11; scales 48; dorsal with black blotch; lower gill raders 17.----------bahiensis.

q^3. A. 10; scales 50; dorsal uniform; lower gill rakers 21.------hallbergi.

p^2. Ventral origin nearer caudal base than gill opening.--opisthopus.

o^2. No teeth on palate.

r^1. Depth 5 3/4 to 6½; vertical fins pale; lower gill rakers 15.--agoo.

r^2. Depth 5; all fins blackish; lower gill rakers 17.-----nigripinnis.

r^3. Depth 4 to 4½; fins not black.----------brevis.

$\underline{r}^4$. Depth 7; lower gill rakers 18.-------

--------gilberti.

$\underline{n}^2$. Broad ribbon like or band like barbel as symphysis of lower jaw.

$\underline{s}^1$. Paired fins black, with pale edges.

------- naresii.

$\underline{s}^2$. Pectoral colorless, triangular black spot at base; ventral black.-spilurus.

$\underline{n}^3$. Bifid barbel at chin.

$\underline{t}^1$. Pectoral base and tip black, pale medially; caudal pale, with black basal spot.--

caudimaculatus.

Cypselurus rubescens (Rafinesque)

Exocoetus rubescens RAFINESQUE, Amer. Month. Mag. Crit. Review, vol. 2, p. 205, 1818 (type locality: Banks of Newfoundland).

Cypselurus rubescens FOWLER and BALL, Bull. Bishop Mus., 26, p. 8, 1925 (off Lisiansky; Laysan; Gardner Island).

--FOWLER, Mem. Bishop Mus., vol. 10, p. 82, 1928, (Lisiansky); off Laysan; Honolulu; Hawaiian Islands; not Guam specimen); vol. 11, no. 5, p. 319, 1931 (compiled).

Exocoetus speculiger VALENCIENNES, Hist. Nat. Poiss., vol. 18, p. 94, 1846 (May 1847) (type locality: Friendly Islands; Sunda Straits; Mauritius; Indian Ocean; Peros-Banhos; Pacific coast of Central America; Port King George). --BLEEKER, Naturk. Tijds. Nederland Indië, vol. 9, p. (259) 273, 1855 (Siboga); Act. Soc. Sci. Ind. Neerland, no. 7, vol. 2, p. 8, 1857 (Amboina); vol. 8 (Acht. Sumat.), p. 55, 1857 (name); Nederland Tijds. Dierk., vol. 3, p. 122, 1865 (Amboina). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 286, 1866 (Australia; Amboina). --BLEEKER, Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 272, 1868 (Guebe, Moluccas); Atlas Ichth. Ind. Neerland, vol. 6, p. 76, pl. ( ) 251, fig. 4, 1866-72 (Singapore; Amboina). --HUTTON, Fishes of New Zealand, p. 55, 1872 --GÜNTHER, Cruise of Curacoa, p. 410, 1873 (Solomons). --BLEEKER, Rech. Faune Madagascar, Pollen et Van Dam, pt. 4, p. 101, 1874 (Mauritius). --LÜTKEN, Vidensk. Medd. Natur. Foren. Kjöbenhavn, p. 403, 1876 (Indian,

Atlantic, Pacific Oceans; Arabian Sea; Honolulu).

--STREETS, Bull. U. S. Nat. Mus., no. 7, p. 75, 1877 (Honolulu). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 186, 1881 (copied). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 366, 1909 (Samoa; Solomons).

Exonautes speculiger JORDAN and EVERMANN, Bull. U. S. Nat. Mus., no. 47, pt. 3, p. 2836 (reference). --SNODGRASS and HELLER, Proc. Washington Acad. Sci., vol. 6, p. 352, 1905 (lat. 17° 23' N., long. 114° 9' W.). --MC CULLOCH, Zool. Res. Endeavour, p. 30, 1909-10 (between Port Stephens and Newcastle, New South Wales); Austral. Mus. Mem., no. 5, pt. 1, p. 106, June 29, 1929 (compiled).

Cypsilurus speculiger KENDALL and RADCLIFFE, Mem. Mus. Comp. Zool., vol. 26, p. 253, 1911 (Guam).

Cypselurus speculiger MC CULLOCH, Fishes of New South Wales, ed. 2, p. 30, 1927.

Exocoetus noveboracensis (not MITCHILL) VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 100, 1846 (Newfoundland).

Exocoetus evolans (not LINNAEUS) VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 101, 1846 (Cartaret Harbor; Tongatabu).

Exocoetus roberti MÜLLER and TROSCHEL, Hist. Barbadoes, Schomburgk, p. 675, 1848 (type locality: Barbadoes).

Exocoetus quadriremis GRAY, Cat. Fish of Gronow, p. 145, 1854 (type locality: Spain; India).

? Exocoetus lamellifer KNER and STEINDACHNER, Sitz. Ber. Akad. Wiss. Berlin, nat. - math. Kl., vol. 54, pt. 1, p. 384, pl. 2, fig. 11, 1866 (type locality: lat. 12° S., long. 33° W.; South Sea). --SCHMELTZ, Cat. Mus. Godeffroy, no. 3, p. 11, 1866 (Pacific Ocean). --LÜTKEN, Videns. Medd. Naturh. Foren. Kjöbenhavn, p. 405, 1876.

Exocoetus volitans (not LINNAEUS) JORDAN and EVERMANN, Bull. U. S. Nat. Mus., no. 47, vol. 1, p. 734, 1896.

Depth 5 4/5 to 6¼; head 4 to 4½, width 1 3/5 to 1 7/8. Snout 3 2/3 to 4 in head from snout tip; eye 3 to 3 7/8, subequal to little greater than snout, 1¼ to 1 2/3 in interorbital; maxillary reaches 4/5 to or to eye, length 3 3/5 to 4 4/5 in head from snout tip; teeth simple, minute, in very narrow bands in jaws; interorbital 2 1/8 to 2 4/5, broad, slightly depressed or shallowly concave medially. Gill rakers 6 or 7 + 17 to 20, lanceolate, length 1¼ to 1 1/3 in gill filaments, which 1 3/5 to 1 7/8 in eye.

Scales 44? to 53 in lateral or axial series to caudal base and 5 or 6 more on latter; 7 or 8 above, 2 or 3 below, 33 to 40 predorsal. Scales with 3 to 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 9 or I, 10, first branched ray 1 7/8 to 2 3/4 in total head length; A. I, 10 to I, 12, first branched ray 2 1/5 to 3; least depth of caudal peduncle 3 2/3 to 4; pectoral rays I, 13 to I, 17, reaches far as or slightly beyond dorsal and anal though not quite to caudal base; ventral 2 2/3 in total to caudal base, reaches back about far as pectoral tips; lower caudal lobe 3 to 3 2/5 in rest of body, lower lobe $1\frac{1}{2}$ in upper lobe.

Back olive brown, sides and below silvery white. Iris silvery white. Vertical fins all more or less pale to whitish, dorsal with black median blotch above. Caudal with dark basal area, lower lobe with dark gray subterminal blotch; tip of upper lobe and all middle of lobe sometimes more or less dusky. Pectoral largely blackish, with rather narrow whitish transverse bar subbasally. Ventral whitish, especially hind border, becomes blackish subterminally.

Arabian Sea, Mauritius, India, Malaya, East Indies, New South Wales, Tasmania, New Zealand, Melanesia, Polynesia, Hawaii. Also the Pacific coast of South America, the Galapagos and the Atlantic. The young are greatly like those of Cypselurus furcatus in general appearance. They may be known by the larger anal, which begins slightly before the dorsal origin. Also each pectoral marked by a single white transverse bar.

1 example. Tataan Passage. February 20, 1908. Albatross Collection. Length 124 mm.

4428. D.5186. Lusaran Light, N. 20° E., 37.80 miles (lat. 9° 53' 30" N., long. 122° 15' 30" E.), between Panay and Negros. March 30, 1908. Length 124 mm.

U. S. N. M., no. 17985. Honolulu. Dr. T. H. Streets. Length 278 mm.

U. S. N. M., no. 42345. Tasmania. A. P. London. Length 260? to 285 mm. Two examples.

Cypselurus oxycephalus (Bleeker)

Exocoetus oxycephalus BLEEKER, Naturk. Tijds. Nederland Indië, vol. 3, p. (740, 747) 771, 1852 (type locality: Macassar; Batavia); vol. 7, p. (227) 228, 1854 (Macassar); Nederland Tijds. Dierk., vol. 3, p. 124, 1866 (Java; Celebes). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 294, 1866 (type; Formosa). --BLEEKER, Atlas Ichth. Ind. Neerland, vol. 6, p. 75, pl. (2) 248, fig. 1, 1866-72 (Java; Celebes); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 7, p. 36, 1873 (Aru Islands). --WEBER, Siboga Exped., vol. 57, Fische, p. 127, 1913 (Macassar).

Exocaetus oxycephalus ELERA, Cat. Fauna Filip., vol. 1, p. 578, 1895 (Luzon; Manila; Navotas).

Exonautes oxycephalus OGILBY, Ann. Queensland Mus., no. 9, pt. 1, p. 5, 1908 (Torres Straits). --MC CULLOCH, Austral. Mus. Mem., no. 5, pt. 1, p. 107, June 29, 1929 (compiled).

Cypsilurus oxycephalus WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 181, 1922 (Batavia; Java Sea; Makassar; Moluccas).

Cypselurus oxycephalus FOWLER and BALL, Bull. Bishop Mus., 26, p. 8, 1925 (off Laysan); Mem. Bishop Mus., vol. 10, p. 81, 1928 (off Laysan; Apia; not type of Exonautes gilberti); vol. 11, no. 5, p. 319, 1931 (south-east Papua).

Cypsilurus unicolor (not VALENCIENNES) JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 209, fig. 12, 1905 (1906) (south of Samoa; between Sydney and Auckland). --JORDAN and DICKERSON, Proc. U. S. Nat. Mus., vol. 34, p. 607, 1908 (note).

Depth 6; head 4 1/5, width 1 3/4. Snout 3½ in head from snout tip; eye 3 3/5, greater than snout, 1½ in interorbital; maxillary reaches 7/8 to eye, length 4 1/8 in head; teeth minute, simple, conic, hardly evident, form feeble narrow bands; interorbital 2 1/8, bony width 3 1/10, broad, nearly level or only depressed medially. Gill rakers 8 + 22, lanceolate, slender, 1 2/5 in eye; gill filaments 3/4 gill rakers.

Scales 48 in axial or lateral series to caudal base and 4 more on latter; 7 above, 3 below, 35 predorsal. Scales with 4 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 10, first branched ray about 3? in total head length; A. I, 10, first branched ray 2 9/10; least depth of caudal peduncle 3 7/8; pectoral rays I, 14, reaches little beyond tips of last dorsal and anal rays though not quite to caudal base; ventral 1 1/10 in head, reaches 2/3 in anal base.

Back brown, sides and below silvery white. Iris silvery white. Dorsal and caudal browmish. Ventral and anal whitish. Pectoral largely blackish, especially medially and terminally, edges pale.

East Indies, Philippines, Queenslnad, Polynesia, Hawaii. This species falls with Exonautes though differs from both Cypselurus rubescens and Cypselurus exiliens in having the upper pectoral ray alone simple and the pectoral without a transverse white band. My example also agrees largely with Bleeker's figure. It does not show the pectoral with pale or whitish all around, and though the median longitudinal part of the fin blackish on the membranes, when the fin is opened. When retracted it has an entirely different appearance due to the silvery gray edges of the rays so that the dark color of the fin is largely obscured, excepth terminally.

One example. Route to Batan. July 21, 1909. Length 201 mm.

Cypselurus melanocercus (Ogilby)

Exocoetus melanocercus OGILBY, Proc. Linn. Soc. New South Wales, vol. 10, pt. 4, p. 123, 1885 (type locality: Middle Harbour, Port Jackson).

Cypsilurus melanocercus OGILBY, Handb. Sydney, p. 124, 1898.

--STEAD, Fishes of Australia, p. 64, 1906 (New South Wales).

--OGILBY, Ann. Queensland Mus., no. 9, pt. 1, p. 5, 1908 (Moreton Bay).

Cypselurus melanocercus MC CULLOCH, Fishes New South Wales, p. 30, 1919; ed. 2, p. 30, 1927.

Depth 6½; head 5, width 1 3/4. Snout 3 1/3 in head from snout tip; eye 3 1/3, equals snout, 1¼ in interorbital; maxillary reaches 4/5 to eye, length 5 in head from snout tip; teeth small conic, simple, in bands in jaws, formed of about 4 transverse series; interorbital 2 2/3, broad, very shallowly concave. Gill rakers 8 + 15, lanceolate, 1 3/4 in gill filaments, which 1 2/3 in eye.

Scales 62 in median lateral or axial series to caudal base and 6 more on latter; 8 above, 3 below, 47 predorsal. Scales with 3 or 4 basal radiating striae and 2 or 3 incomplete auxiliaries, edge scalloped; circuli fine, complete.

D. I, 12, third ray 1 3/4 in total head length; A. I, 10, origin at first 2/5 in dorsal base, first branched ray 2 2/3; least depth of caudal peduncle 3 2/3; pectoral rays I, 13, reaches caudal base; ventral greatly longer than head, reaches base of eighth anal ray; lower caudal lobe 3 2/3 in rest of fish, upper lobe 1½? lower.

Back olive brown, sides and below whitish, evidently silvery white. Iris pale, evidently white. Dorsal and caudal brownish. Anal and ventral whitish, latter medially brownish. Pectoral brown, largely darker or dusky brown submarginally terminally, especially below; lower hind edge of fin whitish, also pale to whitish below and subbasally.

New South Wales.

U. S. N. M. no. 47876. Port Jackson. Australian Museum. Length 196 mm. (caudal tip broken).

Cypselurus cribrosus (Kner)

Exocoetus cribrosa KNER, Reise Novara, Fische, p. 326, 1865 (type locality: Sydney [alternative name for Exocoetus unicolor (not VALENCIENNES) KNER].

Cypsilurus cribrosus MC CULLOCH, Mem. Queensland Mus., vol., 5, p. 59, pl. 71, 1916 (off Port Hacking,) New South Wales.

Cypselurus cribrosus MC CULLOCH, Fishes New South Wales, ed. 2, p. 30, pl. 10, fig. 107b, 1927.

Exonautes cribrosus MC CULLOCH, Austral. Mus. Mem., vol. 5, pt. 1, p. 106, Jan. 29, 1929 (compiled).

Exocoetus unicolor (not VALENCIENNES) KNER, Reise Novara, p. 325, 1865 (Sydney). --JORDAN, Guide Study Fishes, vol. 1, fig. 226, 1905; vol. 2, p. 213.

Exocoetus dovii (not GILL 1863) OGILBY, Austral. Mus. Mem., vol. 20-22, p. 71, 1889 (Lord Howe Island).

Exonautes rondeletii (not CUVIER) WAITE, Rec. Austral. Mus. vol. 5, pp. 156, 195, 1904 (Admiralty Islands).

Exonautes fulvipes OGILBY, Proc. Roy. Soc. Queensland,

vol. 21, p. 8, 1908 (type locality: Lord Howe Island).

Depth 6 to 7; head 4 4/5, width 2 1/5. Snout 3 4/5 in head from snout tip; eye 2 4/5 to $3\frac{1}{4}$, little greater than snout, equals interorbital; maxillary reaches about 3/4 in snout, length $4\frac{1}{2}$ in head from snout tip; interorbital low, concave. Gill rakers + 19, 1/3 of eye.

Scales 52 in lateral series; 7 above lateral line.

D. II, 10, first branched ray 1 7/8 in total head length; A. I, 11, first branched ray 2 1/8; least depth of caudal peduncle $3\frac{1}{2}$; upper caudal lobe 1 2/5 in lower lobe which 3 1/5 in rest of fish; pectoral reaches little beyond depressed dorsal,or to caudal base. 1 2/5 in body length to caudal base, 2 upper rays simple; ventral 3, inserted slightly nearer gill opening than caudal base.

Ultramarine blue above, silvery below. Upper caudal lobe darker, edges of both lobes paler. Pectorals uniformly dark, edges and lowermost rays pure white. Ventrals light colored, rays either little dusky or white with darker edges. Length 310 mm.

(Ogilby, McCulloch.)

New South Wales, Lord Howe Island, Admiralty Island.

Cypselurus albimaculatus new species

Cypsilurus speculiger (not RAFINESQUE) KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 253, 1911 (Guam).

Cypselurus rubescens (not RAFINESQUE) FOWLER, Mem. Bishop Mus., vol. 10, p. 82, 1928 (Guam specimen; part); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (lat. 7° S., long. 124° W.).

Depth 5 2/3 to 5 3/4; head 4 1/5 to 4¼, width 1 4/5 to 1 7/8. Snout 3 2/3 to 3 4/5 in head from snout tip; eye 3 1/5 to 3 2/3, equal to or little greater than snout, 1 1/5 to 1¼ in interorbital; maxillary reaches 3/4 to eye, length 4 1/3 to 4½ in head from snout tip; teeth very small, simple, conic, in narrow bands in jaws; interorbital 2 1/2 to 2 2/3, broad, slightly depressed medianly. Gill rakers 7 + 18, lanceolate, 1¼ in gill filaments, which ½ of eye.

Scales 50 or 51 in lateral line to caudal base and 5 more on latter; 7 above, 2 or 3 below; 39 to 42 predorsal. Scales with 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 10, first branched ray 2 3/4? to 2 7/8 in total head length; A. I, 10, first branched ray 3 1/8 to 3 1/3?; least depth of caudal peduncle 3½ to 3 7/8; P. II, 18, fin reaches little beyond base of last dorsal ray though not quite so far as tip; ventral longer than head, reaches penultimate anal ray base; lower caudal lobe 3 1/8? to 3 2/5? in rest of fish, upper lobe 1¼ to 1 1/3? in total head length.

Back olive brown, sides and below silvery white. Dorsal and caudal brownish, inner part of each lobe of latter little darker. Anal whitish. Pectoral dusky to blackish brown terminally, with broad whitish basal area below, upper basal area dusky. Ventral pale to whitish, scarcely brown medially.

Diagnosis. Related to Cypselurus rondeletii in its 2 uppermost simple pectoral rays, but differs markedly in the presence of a large pale blotch below and subbasally on each pectoral.

Type. U. S. N. M., no. 65810.

This species also closely resembles Cypselurus rubescens (Rafineque) and may be further distinguished by its similar markings on the pectoral fin less contrasted, or not so decidedly black and white.

U. S. N. M., no. 65810. Guam. Albatross Collection (A 200). Length 280? mm. As Cypsilurus speculiger. Type.

U. S. N. M., no. 89734. Lat. 7° S., long. 124° W. September 7, 1929. Dr. A. K. Fisher. Pinchot Expedition. Length 300? mm. As Cypselurus rubescens. (alba white + macula spot, with reference to the white pectoral blotch.)

Cypselurus rondeletii (Valenciennes)

Exocoetus rondeletii VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 115, pl. 562, 1846 (type locality: Naples; Sicily; Canaries). --WAITE, Rec. Austral. Mus., vol. 5, p. 156, 1904 (Lord Howe Island).

Cypsilurus rondeleti WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 193, 1922 (probably East Indies).

Cypselurus rondeletii FOWLER and BALL, Bull. Bishop Mus., 26, p. 8, 1925 (at 180th meridian; Laysan); FOWLER, Bull. Bishop Mus., 38, p. 7, 1927 (lat. 6° 40' N., long. 171° W.; between Seattle and Honolulu); Mem. Bishop Mus., vol. 10, p. 81, 1928 (at 180th meridian; Laysan); Hong Kong Nat., vol. 3, nos. 3-4, Dec. 1932, p. 275, fig. 18 (Polynesia; Atlantic).

Exocoetus brachycephalus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 297, 1866 (type locality: China). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, (873)(1874) (reference). --GÜNTHER, Ann. Mag. Nat. Hist., ser. 4, vol. 13, p. 157, 1874 (Chefoo). --LÜTKEN, Vidensk. Medd. Naturh. Foren. Kjöbenhavn, p. 405 (110), 1876 (Java).

Exocaetus brachycephalus ELERA, Cat. Fauna Filip., vol. 1, p. 578, 1895 (Luzon; Cavite; Santa Cruz).

Exonautes brachycephalus JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 26, p. 539, fig. 2, 1903 (Misaki; Tokyo). --CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (compiled).

Cypselurus brachycephalus JORDAN, TANAKA, SNYDER, Journ. College Sci., vol. , p. 107, fig. 81, 1913 (Misaki; Sagami).

Exonautes brachycephalus CHU, Biol. Bull. St. John's Univ. no. 1, p. 88, Jan. 1931 (reference).

Cypselurus unicolor (not VALENCIENNES) JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 209, fig. 12, 1905 (1906) (south of Samoa).

Depth 5½; head 4 2/5, width 1 3/4. Snout 3½ in head from snout tip; eye 3½, subequal with snout, 1 2/5 in interorbital; maxillary reaches 3/4 to eye, length 4¼ in head from snout tip; teeth very feeble, scarcely developed, simple, small, short; interorbital 2 2/3, broad, shallowly concave. Gill rakers 8 + 18, lanceolate, slender, 1¼ in gill filaments, which 1 2/3 in eye.

Scales 48 in lateral or axial series to caudal base and 4 more on latter; 7 above, 3 below, 38? predorsal. Scales with 4 or 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 10, first branched ray 2 in total head length; A. I, 12, second branched ray 2 1/3; least depth of caudal peduncle 4; pectoral rays II, 17, reaches beyond dorsal and anal tips posteriorly, though not quite to caudal base; ventral much longer than head, not quite reaching far back as tip of last anal ray; lower caudal lobe 3 1/5 in rest of fish, upper lobe 1 2/5 in lower or about long as head.

Brown, little paler below. (evidently discolored dark due to formaline). Fins all more or less brownish. Pectoral largely uniform dark or dusky brown, though its lower and posterior edges whitish.

East Indies, China, Polynesia, Hawaii. The specimen described above seems closer to the account and figure of Exocoetus rondeletii than any other species. Valenciennes gives D. 11 or 12, A. 11 to 13"etc". His figure is faulty as the anal is shown inserted before the dorsal. The pectoral is shown with apparently the 4 uppermost rays all simple, a condition I have never seen in any exocoetid. The ventrals are shown with a dark medial basal area, also evident though not so contrasted in my specimen. Jordan and Seale's figure of Cypselurus unicolor surely is the present species, with appended barnacles, not only in its fin formula but its dark uniform pectoral as well. It clearly shows pectoral rays II, 15.

Though Jordan and Starks have separated the Japanese form as Exonautes brachycephalus, their figure and incomplete description do not reveal any tangible characters for distinction as may be seen from the following:

Depth 6 1/5; head 4 4/5. Snout 5 4/5 in head; eye 3 1/6, greater than snout; maxillary reaches opposite front eye edge, length 4 1/5 in head; interorbital little greater than eye, low, concave medially.

Scales 49 in lateral series; 34 predorsal. Lateral line as conspicuous ridge along lower sides of belly.

D. I, 9, first branched ray about 1 9/10 in head; A. I, 11, first branched ray 3; least depth of caudal peduncle 2 4/5; upper caudal lobe about 1 2/5 in lower, which 3 7/8 in rest of fish; ventral 3 1/5; pectoral 1 2/5, reaches opposite base of last dorsal ray, second simple ray 1 2/5 in fin length (first branched ray).

Clear light brown above, silvery below. Dorssl and anal colorless, except small dark brown spot at tips of fifth and sixth rays. Caudal dusky. Pectoral membrane dark brown, uniform, rays of outer side silvery, giving closed fin silvery appearance. Ventral brown, inner and outer ray very light. Length 130 mm.

(Jordan and Starks.)

One example (with U. S. N. M. 52348). Apia, Samoa. Bureau of Fisheries. Length 270 mm. As Cypsilurus unicolor.

Cypselurus exsiliens (P. L. S. Müller)

Exocoetus exsiliens P. L. S. MÜLLER, Ritters C. Linné Natursystems - Suppl., Nüremberg, p. 209, 1776 (type locality: Carolina). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference).

Exocetus exiliens BONNATERRE, Tabl. Ichth., p. 181, 1788 (Carolina). --SWAINSON, Nat. Hist. Animals, vol. 2, p. 296, 1839 (on Bloch pl. 397).

Exocoetus exiliens GMELIN, Syst. Nat. Linn., pt. 1, p. 1400, 1789 (Carolina). --BLOCH, Naturg. Ausl. Fische, vol. 9, p. 10, pl. 397, 1795 (Mediterranean; Red Sea). --SCHNEIDER, Syst. Ichth. Bloch, p. 429, 1801 (Carolina). --STEINDACHNER, Verhand. Zool. bot. Ges. Wien, vol. 16, p. 482, 1866 (Hong Kong). --GÜNTHER, Ann. Mag. Nat. Hist., ser. , vol. 3, p. 147, 1909 (type specimen).

Exocaetus exiliens LACÉPÈDE, Hist. Nat. Poiss., vol..5, pp. 401, 403 (not pl. 12, fig. 3), 1803 (Arabia; Mediterranean; Rhone; tropics; not Brazil).

Exonautes exsiliens CHU. Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference).

Cypselurus exsiliens FOWLER, Hong Kong Nat., vol. 3, nos. 3-4, p. 275, Dec. 1932 (Atlantic).

Exocaetus fasciatus RICHARDSON, Ichth. China Japan, p. 265, 1846 (type locality: Sea of China).

Mastacembelus fasciatus BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1873 (reference; error).

Exocoetus nigripennis (not VALENCIENNES) BLEEKER, Atlas Ichth. Ind. Néerland, vol. 6, p. 70, 1866-72 (part; on Richardson).

Depth 4 1/8 to 4¼; head 5½ to 5 3/4, width 1 1/3 to 1 2/5. Snout 4 to 4¼ in head from snout tip; eye 2¼ to 2 2/5, 1 1/6 to 1 1/5 in interorbital; maxillary reaches 1/8 in eye, length 2¼ to 3 in head from snout tip; interorbital 2 1/8, concave. Gill rakers 7 + 18, lanceolate, 3/4 of gill filaments, which ½ of eye.

Scales 44 or 45 in axial lateral series to caudal base and 5 more on latter; 7 above, 2 below, 30 predorsal. Scales with 4 basal radiating striae, edge scalloped; circuli 17 to 19.

D. II, 10, first branched ray 1½ in total head length; A. I, 11, I, first branched ray 1¼ to 1 2/5; pectoral reaches caudal base, fin 1/3 in total length to caudal base, first and second rays simple, former trifle longer, both with rather wide distensible connecting membranes, first ray 2 1/5 in fin; ventral inserted midway between hind eye edge and caudal base, fin extends to caudal base, length 1 3/4 in pectoral.

Brownish above, silvery white below. Belly with 3 blackish cross bands. Black spot on upper part of front dorsal rays, fin otherwise whitish. Anal whitish. Caudal whitish, lower lobe with blackish spot about 1/3 its distance from base. Pectoral dusky, edged paler above, with blackish basal, median and terminal areas transversely. Ventral somewhat similar, only basal whitish area larger.

Open tropical seas.

A. N. S. P., no. 7494. Lat. 31° 30' N., long. 36° 36' W. Length 70 mm.

A. N. S. P., no. 46296. Atlantic Ocean. C. L. Bonaparte (346). Dr. T. B. Wilson. Length 56 mm.

Cypselurus monocirrhus (Richardson)

Exocaetus monocirrhus RICHARDSON, Ichth. China Japan, p. 265, 1846 - (type locality: Sea of China). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (copied).

Exonautes, monocirrhus CHU, Biol. Bull. St. John's Univ., no. 1, p. 87, Jan. 1931 (reference).

Cypselurus monocirrhus FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 276, Dec. 1932 (compiled).

Space between snout tip and ventrals not reaching middle of anal. Eye rather large, antero lateral in head; black barbel wrinkled, springs from end of chin, flat or furrowed on surface of membrane between jaws, less than head in length. D. 13; A. 13; pectoral 15, extends little beyond caudal base; ventral rays 6, inserted midway between snout tip and front portion of anal. Length 57 mm.

(Richardson.)

China. Only known from Richardson's description.

Cypselurus solandri (Valenciennes)

Exocoetus solandri VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 129, 1846 (type locality: Siychelles [not Tahiti]). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 284, 1866 (Indian Ocean). --BLEEKER, Rech. Faune Madagascar, Pollen and Van Dam, pt. 4, p. 101, 1874 (reference). --GÜNTHER, Rep. Voy, Challenger, vol. 31, p. 35, pl. 4, fig. A, 1889 (East Africa). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 487 (526), pl. 49, fig. 4, 1891 (Madagascar).

Cypselurus solandri JORDAN, TANAKA, SNYDER, Journ. College Sci., Tokyo, p. 108, 1913 (compiled).

Exocoetus cirriger PETERS, Monatsb. Akad. Wiss. Berlin, p. 555, pl., fig. 1, 1877 (type locality: China).

Exonautes cirriger CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference).

Cypselurus cirriger FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 279, fig. 22, Dec. 1932 (copied).

Depth 6 3/4; head 4 3/5. Snout 3 3/5 in head: from snout tip; eye 3 3/5, 1 in snout, 1½ in postocular; maxillary concealed; front part of each mandibular ramus with broad, delicate, black, skinny flap, edge below fringed with several cirrhi, some longer than others, as long as eye; interorbital low, flat.

Scales 66 in lateral series to caudal base and 4 more on latter; 10 between dorsal and anal anteriorly.

D. II, 10, fourth branched ray 3 3/5 in length to caudal base; A. 11, third ray 2 1/5 in total head length; least depth of caudal peduncle 3 3/4; pectoral reaches nearly to hind basal end of dorsal, fin 1 3/5 in length to caudal base; ventral 2 1/3, reaches caudal base, origin midway between hind eye edge and caudal base; upper caudal lobe 1 2/3 in lower which 3 3/4 in rest of fish.

Back greenish , otherwise color largely silvery. Before ventrals 3 broad rose colored transverse bands, another behind ventral, more in distinct one across front of anal base. Greater part of dorsal, lower hind half of pectoral and ventrals black. Oblique band across lower caudal lobe and outer half of anal blackish. Length 145 mm.

(Günther.)

Seychelles, East Africa, Madagascar, China.

Günther's excellent account and figure of this species agrees largely with that of Exocoetus cirriger Peters. His specimen was 138 mm.

Cypselurus arcticeps (Günther)

Exocoetus arcticeps GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 289, 1864 (type locality: China). --BLEEKER, Nederland Tijds. Dierk., vol. 4, p. 149, 1874 (reference).

Exocoetus arcticeps MACLEAY, Proc. Linn. Soc. New South Wales, vol. 8, p. 278, 1883 (south east New Guinea). --ELERA, Cat. Fauna Filip., vol. 1, p. 577, 1895 (Luzon; Cavite; Santa Cruz).

Cypsilurus arcticeps WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 182, 1922 (type).

Cypselurus arcticeps FOWLER, Mem. Bishop Mus., vol. 10, p. 82, 1928 (compiled). --CHU, Biol. Bull. St. John's Univ. Shanghai, no. 1, p. 88, Jan. 1931 (reference). --FOWLER, Hong Kong Nat., vol. 3, nos. 3-4, p. 277, Dec. 1932 (compiled).

Depth 6; head 4, width 1½. Snout 3 2/3, in head from snout tip; eye 3 2/3, subequal with snout, 1 2/3 in interorbital; maxillary reaches 3/4 to eye, length 3 7/8 in head from snout tip; teeth minute, feeble, in very narrow bands in jaws; interorbital 2½, broad, level. Gill rakers 8+16, lanceolate, 1 1/5 in gill filaments, which ½ eye.

Scales 43 in median lateral series to caudal base and 4 more on latter, mostly fallen and counts according to pockets; 7 above, 32? predorsal. Scales with 5 or 6 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 13, first branched ray 1 2/5 in total head length; A. I, 7, first branched ray 2 3/5; least depth of caudal peduncle 3 2/3; P. I, 12, reaches slightly beyond caudal base; ventral reaches back nearly far as tip of last anal ray, fin 2 4/5 in length to caudal base; lower caudal lobe 3 1/5 in rest of body, upper lobe short (broken).

Brown above, sides and below pale, evidently silvery white in life. Iris pale. Dorsal and anal whitish. Caudal with upper lobe pale, lower brown. Pectoral dusky to blackish brown basally, terminally black, separated from bases of lower rays by well contrasted triangular white area, which also somewhat extended forward along upper edge of fin submarginally. Ventral whitish.

East Indies, Philippines, China.

A striking species, known by its white wing bars, pale dorsal, anal and ventral, besides its structural characters in combination.

4390. Lat. 25° 10' N., long. 166° 20' W. north of Necker Island. November 3, 1907. Length 170? mm.

Cypselurus nigricans (Bennett)

Exocoetus nigricans BENNETT, Narrative Whaling Voy., vol. 2, p. 287, 1840 (type locality: Atlantic and Pacific lat. N. 5°).

--GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 290, 1866 (Java).

--BLEEKER, Atlas Ichth. India Nëerland, vol. 6, p. 75, 1866-72 (Atlantic lat. 9° 50" N., long. 25° 5' W., of Paris).

--GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 367, 1909 (Atlantic, Indo-Pacific). --WEBER, Siboga Exped., vol. 57, Fische, p. 126, 1913 (Bay of Batjan).

Cypsilurus nigricans WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 183, 1922 (Malacca Straits; Java Sea; Bay of Batjan).

Cypselurus nigricans FOWLER, Mem. Bishop Mus., vol. 10, p. 82, 1928 (compiled); vol. 11, no. 5, p. 319, 1931 (compiled).

Exocoetus bicolor VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 111, 1846 (type locality: Atlantic). --SCHMELTZ, Cat. Mus. Godeffroy, no. 1, p. 10, 1864 (South Seas); no. 2, p. 9, 1865 (South Seas).

Exocoetus spilopus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 118, 1846 (type locality: La Rochelle; St. Helena; Antilles; Sea of Indies; Arabia; sea west of Minicoi; De Witt Land in Australia). --LÜTKEN, Vidensk. Medd. Nat. Foren. Kjöbenhavin, p. 401, 1876 (Indian Ocean).

Depth 5 1/3; head 3 7/8, width 2. Snout 3½ in head from snout tip; eye 3 2/5, greater than snout, 1 1/5 in interorbital; maxillary reaches 4/5 to eye, length 4 1/5 in head from snout tip; interorbital 2½, low, concave. Gill rakers 5 + 16, lanceolate, 1 4/5 in gill filaments, which 1 7/8 in eye.

Scales 48 in lateral axial series from gill opening to caudal base and 3 or 4 more on latter; 8 above, 30 predorsal. Scales with 4 to 7 basal radiating striae; circuli fine, complete.

D. I, 14, first branched ray 1 1/5 in total head length; A. I, 9, first branched ray 2½; least depth of caudal peduncle 3 2/3; lower caudal lobe 3¼ in rest of fish; pectoral 1 1/3, reaches caudal base; ventral 2 3/5, fin origin midway between hind eye edge and caudal base.

Back dusky neutral, with violet reflections. Upper surface of head similar, with distinct violet streak from upper hind edge of eye to pectoral origin. Sides of head brilliant silvery white and sides of trunk soiled or tinged dusky. Violet tints conspicuous at caudal base and at ventral axil. Iris brilliant violet. Lips dusky. Dorsal largely jet black, paler or soiled dusky gray in front. Upper caudal lobe white, base blackish, lower lobe entirely jet black. Pectoral largely black, axial with violet tinge, only lower edge and median portion of lower rays gray white or whitish. Ventral with outer 2/3 jet black, outer and inner edges of fin whitish, median rays basally gray and this shade extending to black terminal blotch. Anal white, hinder outer terminal part black, in strong contrast.

Tropical Atlantic, Indian and Pacific Oceans. Arabia, Malaya, East Indies, Australia.

A. N. S. P., no. 45466. Sea Isle City, New Jersey. September 14, 1915. E. N. Fox. Length 175 mm.

Cypselurus altipennis (Valenciennes)

Exocoetus altipennis VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 109, pl. 560, 1846 (type locality: East Indies; Cape of Good Hope). --BLEEKER , Naturk. Tijds. Nederland Indië, vol. 21, p. 56, 1860 (reference). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 270, June 1925 (Algoa Bay; Agulhas Bank).

Exocoetus altipinnis CASTELNAU, Mém. Poiss. Afrique Australe, p. 64, 1861 (sent from Algoa Bay). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 290, 1866 (copied). --BLEEKER, Atlas Ichth. India Néerland,vol. 6, pl. ( ) 247, fig. 3, 1866-67. --DAY, Fishes of India, Suppl., p. 804, 1888 (copied); Proc. Zool. Soc., London, p. 265, 1888 (Bombay); Fauna British India, Fishes, vol. 1, p. 430, 1889. --GILCHRIST, Marine Invest. South Africa, p. 152, 1901 (reference).

Cypsilurus altipinnis SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 240, 1907 (Zamboanga). --WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 184, 1922 (Java Sea; Red Sea). --DUNCKER and MOHR, Mitteil. Naturh. Mus. Hamburg, vol. 42, p. 129, 1926 (North Pelew Islands). --MC CULLOCH, Austral. Mus. Mem., no. 5, pt. 1, p. 106, 1929 (compiled).

Cypselurus altipennis FOWLER, Mem. Bishop Mus., vol. 10, p. 82, 1928 (between Honolulu and San Francisco).

Exocoetus speciliger (not VALENCIENNES) BLEEKER, Nat. Tijds. Nederland Indië, vol. 9, p. 273, 1855.

Exocoetus katoptron BLEEKER, Nederland Tijds. Dierk., vol. 2, p. 115, 1863 (type locality: Siboga, Sumatra). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 289, 1866 (type). --BLEEKER, Atlas Ichth. Ind. Neerland, vol. 6, p. 72, 1866-72 (Sumatra). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. , p. 367, 1909 (Sumatra; Samoa).

Exocoetus kataptron VOGT, Naturk. Tijds. Nederland Indië, vol. 66, p. 180, 1907 (Siboga).

Cypsilurus katoptron JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 211, fig. 16, 1905 (1906) (south of Samoa).

Cypselurus katoptron MC CULLOCH, Records Western Austral. Mus., vol. 1, pt. 2, p. 84, 1912.

Exocoetus robustus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 289, 1866 (type locality: Australia [Western Australia]).

--MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 187, 1881 (copied).

Depth 5½; head 4, width 1 4/5. Snout 4 in head from snout tip; eye 3 1/10, greatly exceeds snout, 1 1/3 in interorbital; maxillary reaches 4/5 to eye, length 4 1/8 in head from snout tip; teeth not evident; interorbital 2 4/5, wide, shallowly concave. Gill rakers 4 + 17, lanceolate, 1 1/3 in gill filaments, which 1 2/3 in eye.

Scales 41 in median lateral series to caudal base and 4 more on latter; 8 above, 3 below, 33? predorsal. Scales with 4 or 5 basal radiating striae; circuli fine, complete.

D. I, 12, first branched ray 2 in total head length; A. I, 10, first branched ray 2 4/5; least depth of caudal peduncle 3 2/3; P. I, 13, reaches little beyond base of last dorsal or anal ray though not to tips of either; ventral slightly longer than head, reaches middle of ventral base; lower caudal lobe 3 2/5 in rest of fish, upper lobe 1 1/3? in lower lobe.

Brown on back and upper surface, sides and below silvery white, now stained livid or drab brown. Iris slate or neutral gray, doubtless due to formaline. Dorsal and caudal more or less dusky, especially terminally. Anal and ventral white. Pectoral largely dark or neutral dusky, terminally neutral black, two areas sharply contrasted by oblique whitish bar parallel with hind lower fin edge, which also pale to whitish.

Red Sea, South Africa, India, East Indies, Philippines, Western Australia, Micronesia, Polynesia.

U. S. N. M., no. 58044. Zamboanga. 1906. Dr. E. A. Mearns. Length 168?mm.

A. N. S. P., no. 50732. Between San Francisco and Honolulu. 1920. Dr. H. A. Pilsbry.

Cypselurus furcatus (Mitchill)

Exocoetus furcatus MITCHILL, Trans. Liter. Philos. Soc. New York, vol. 1, p. 449, pl. 5, fig. 2, 1815 (type locality: New York). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 286, 1866 (India). --LÜTKEN, Vidensk. Medd. Natur. Foren., Kjöbenhavn, p. 400, 1876 (Indian Ocean). --DAY, Fishes of India, pt. 3, p. 519, 1877 (copied); Fauna British India, Fishes, vol. 1, p. 429, 1889. --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 365, 1909 (Indian Ocean; Tahiti).

Exocoetus nuttallii LE SUEUR, Journ. Acad. Nat. Sci. Philadelphia, vol. , p. 10, pl. 4, fig. 1, 1821 (type locality: Gulf of Mexico).

Cypsilurus nuttalii SWAINSON, Nat. Hist. Animals, vol. 2, p. 296, fig. , 1839. (reference)

Exocoetus dussumieri VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 132, pl. 564, 1846 (type locality: Cape of Good Hope).

Exocoetus procne FILIPPI and VERANAY, Medit. Nota, p. 10, fig. 5, 18 .

Exocoetus maculipinnis VINCIGUERRA, Ris. I. Violante 113 pl.

1 f-6, 1883

Depth 4 3/5 to 5; head 4 1/5 to 4¼, width 1 7/8 to 2. Snout 3 4/5 to 4 in head from snout tip; eye 2 3/4 to 3 1/8, greater than snout, 1 1/6 to 1 1/5 in interorbital; maxillary reaches 4/5 or to eye, length 3 7/8 to 4 in head from snout tip; interorbital 2½ to 2 3/5, low, flattened to slightly concave. Gill rakers 5 or 6 + 17 or 18, lanceolate, 1 1/3 in gill filaments, which 2¼ in eye; 2 or 3 above and as many below rudimentary.

Scales 50? to 56 in axial lateral series to caudal base and 5 or 6 more on latter; 8 above, 2 below, 34 to 36? predorsal. Scales with 3 or 4 basal rodiating striae; circuli fine, mostly complete.

D. I, 12 or I, 13, first branched ray 1 1/5 to 1¼ in total head length; A. I, 8, first branched ray 1 4/5 to 2; least depth of caudal peduncle 2 3/4 to 2 4/5; upper caudal lobe 1 1/3 in lower, which 4 1/5 in rest of fish; pectoral 1 2/3, reaches middle of depressed anal; ventral 2 1/3, inserted midway between front of pupil and caudal base.

Brownish on back and head above, sides and below silvery white. Dorsal and caudal tinged with dusky as 2 or 3 larger dark spots on former fin basally and on latter fin on lower lobe. Anal pale or whitish, with dusky spots at tips of some rays. Pectoral contrasted blackish and white, with braod whitish shade extending from axil obliquely to upper rays near terminal ends, and some rays tipped with whitish. Ventral black, except two outer white rays.

India, Polynesia, also tropical Atlantic.

A. N. S. P., no. 7481. Atlantic Ocean. C. L. Bonaparte (no. 190). Dr. T. B. Wilson. Length 82 mm.

A. N. S. P., no. 22446. Newport, Rhode Island. Joseph Leiday and Samuel Powell. Length 137 mm.

A. N. S. P., no. 45479. Newport, Rhode Island. Messrs. Lee, Omar and Austin. Length 145 mm.

Cypselurus hexazona (Bleeker)

Exocoetus hexazona BLEEKER, Naturk. Tijds. Nederland Indië, vol. 4, p. 206, 1853 (type locality: Muntok, Banka); Nederland Tijds. Dierk., vol. 3, p. 118, 1863 (Banka); Atlas Ichth. Indië Nëerland, vol. 6, p. 73, pl. (5) 251, fig. 3, 1866-72 (Banka).

Cypsilurus hexazona WEBER and BEAUFORT, Fishes Indo-Austral. Archip., vol. 4, p. 185, 1922 (compiled).

Depth 4 4/5; head 3 3/4, width 1½. Snout 4 in head from snout tip; eye 2 1/3, greater than snout, about equals interorbital; maxillary reaches opposite front eye edge, length 4 in head from snout tip; interorbital low.

Scales 48 in lateral series.

D. I, 9, first branched ray 2 1/5 in total head length; A. I, 8, first branched ray 3 1/5; least depth of caudal peduncle 2 2/3; lower caudal lobe $3\frac{1}{2}$ in rest of fish; pectoral rays I, 13, fin reaches middle of dorsal or 1 4/5 in length to caudal base; ventral rays 6, fin not quite reaching end of anal, origin nearly midway between snout tip and caudal base, length 2 2/5 in body to caudal base.

Above bluish green, sides and below silvery. Body with 6 broad brown transverse bands, first through eye, second close before pectoral, third close behind pectoral, fourth above ventral base, fifth from front of dorsal till before anal, sixth from last dorsal to last anal rays. Vertical fins clear, dorsal with broad brown edge, anal and lower caudal lobe tipped brown. Paired fins brownish or blackish violet, transverse clear band on middle of pectoral. Length 54 mm. (Bleeker.)

East Indies. Weber and Beufort comment "This is the young stage of some species close to C. altipennis and nigricans, from which it seems to differ in the low number of dorsal rays."

Cypselurus hirundo (Steindachner)

Exocoetus hirundo STEINDACHNER, Verh. Zool. bot. Gesell. Wien, vol. 16, p. 482, pl. 6, fig. 2, 1866 (type locality: Hong Kong).

Cypsilurus hirundo JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 26, p. 542, 1903 (Wakanoura).

Cypselurus hirundo JORDAN, TANAKA, SNYDER, Journ. College Sci., Tokyo, vol. , p. 107, 1913 (Wakanoura). --JORDAN and METZ, Mem. Carnegie Mus., vol. 6, no. 1, p. 25, 1913 (Fusan). --CHU, Biol. Bull. St. John's Univ., no. 1, p. 88, Jan. 1931 (reference). --FOWLER, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 278, fig. (modified), Dec. 1932 (compiled).

Depth 6; head 4¼. Snout 3 4/5 in head; eye 3 1/8, greater than snout; maxillary reaches opposite front eye edge, length 3 2/3 in head; interorbital low.

Scales 54 to 56 in lateral series; 8 above, 1 below.

D. IV, 9, first branched ray 1 1/10 in head; A. 10 (9 on figure), third ray 2 1/5; least depth of caudal peduncle 3 3/4; upper caudal lobe 1¼ in lower, which 3 3/5 in rest of fish; pectoral rays 14, not quite reaching end of depressed dorsal or 1½ in body to caudal base; ventral rays 6, fin reaching hind end of depressed anal, length 2 3/4 in body to caudal base, origin little nearer caudal base than hind eye edge.

Contrasted dark and whitish, especially fins, which all with more or less blackish, basally pale or whitish. Caudal with base of upper lobe pale and 2 large rounded whitish spots on lower lobe. Belly blackish. Length of figure 185 mm. (Steindachner.)

China.

Cypselurus simus (Valenciennes)

Exocoetus simus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 105, 1846 (type locality: Hawaii). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 296, 1866 (copied); Rep. Voy. Challenger, vol. 31, pt. 2, p. 37, 1888 (Honolulu); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 369, 1909 (Hawaiian Islands).

Cypsilurus simus JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu). --SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904) (Honolulu; Kauai; Molokai). --JORDAN and EVERMANN, Bull. Bur. Fisher., vol. 23, pt. 1, p. 134, fig. 46, 1903 (1905) (Honolulu). --EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 58 (Bacon, Bulan, Philippines). --SEALE, Philippine Journ. Sci., vol. 9, p. 60, 1914 (Hong Kong).

Cypselurus simus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 15 (Honolulu); Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii); Bull. Bishop Mus. 26, p. 9, 1925 (Lahaina, Maui; Johnston Island); Mem. Bishop Mus., vol. 10, p. 85, 1928 (Honolulu; Tahiti; Lahaina; Johnston Island). --BORODIN, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 46, 1930 (Polloc Harbor, Philippines). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929, p. 603 (Hong Kong); Mem. Bishop Mus., vol. 11, no. 5, p. 319, 1931 (compiled). --CHU, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference). --FOWLER, Hong Kong Nat., vol. 3, nos. 3-4, p. 276, fig.19, Dec. 1932 (Hong Kong, Melanesia, Polynesia, Hawaii).

Exocoetus poecilopterus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 112, pl. 561, 1846 (type locality: New Britain). --BLEEKER, Nat. Tijds. Nederland Indië, vol. 3, pp. 231, 249, 1852 (Moluccas). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 291, 1866 (Formosa). --BLEEKER, Atlas Ichth. India Néerland, vol. 6, p. 74, pl. 5, fig. 5 (copied), 1866-72 (Banda). --DAY, Fishes of India, pt. 3, p. 518, pl. 120, fig. 4, 1877 (part); Fauna British India, vol. 1, p. 430, fig. 138, 1889 (part). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 369, 1909 (New Pommerania).

Exocaetus paecilopterus ELERA, Cat. Fauna Filip., vol. 1, p. 577, 1895 (Luzon; Cavite; Santa Cruz).

Cypsilurus poecilopterus JORDAN and STARKS, Proc. U.S.Nat. Mus., vol. 26, p. 542, 1903 (Hakodate). --JORDAN and SEALE, Bull. Bur. Fisher. , vol. 25, p. 210, fig. 14, 1905 (1906) (off western Tutuila). --KENDALL and RADCLIFFE, Mem. Mus. Comp. Zool., vol. 35, p. 86, 1912 (lat. 18°47.1' S., long. 89° 26' W.). --WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 186, fig. 63 1922 (Flores). -- ANONYMOUS, Ill. Jap. Aquat. Pl. Animals, vol. 1, pl. 21. fig. 1, 1931.

Cypselurus poecilopterus SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 409, 1912 ( ). --FOWLER and BALL, Bull. Bishop Mus., 26, p. 8, 1925 (Johnston Island); Mem. Bishop Mus., vol. 10, p. 83, 1928 (Samoa; Johnston Island).

Exocoetus alatus (SOLANDER) VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 113, 1846 (type locality: Tahiti).

Exocoetus neglectus (not BLEEKER) STEINDACHNER and DÖDERLEIN, Denks. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, pt. 1, p. 512, 1900 (Honolulu).

Depth 4 7/8 to 5¼; head 3 4/5 to 4 1/8, width 1 2/3 to 1 3/4. Snout 4 1/8 to 4 1/5 in head from snout tip; eye 3 to 3 1/3, greater than snout, 1¼ to 1 3/5 in interorbital; maxillary reaches 3/4 to 4/5 to eye, length 4¼ to 4 2/3 in head from snout tip; teeth minute, simple, conic, in narrow bands in jaws; interorbital 2¼ to 2 1/3, broad, little depressed medially. Gill rakers 6 + 15, lanceolate, ½ gill filaments, which 1 4/5 in eye.

Scales 40 to 52 in lateral or axial series to caudal base and 5 or 6 more on latter; 8 to 10 above, 3 below, 32 to 36 predorsal. Scales with 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 11 or I, 12, first branched ray 1 7/8 to 2¼ in total head length; A. I, 7 or I, 8, first branched ray 2 3/4 to 3; least depth of caudal peduncle 3 to 3 1/8; pectoral I, 14 or I, 15, reaches slightly beyond bases of last dorsal and anal rays; ventral length longer than head, reaches base of last anal ray; lower caudal lobe 3 1/8? to 3 3/5? in rest of body.

Back olive brown, sides below and under surfaces silvery white. Iris silvery white. Dorsal and caudal pale uniform brownish. Iris whitish. Pectoral browmish, membranes darker terminally, upper half of fin with scattered blackish spots or blotches mostly terminally and sometimes much less numerous or absent toward fin base. Ventral largely whitish marginally, medially dull or pale brownish.

India, East Indies, Formosa, Japan, Melanesia, Polynesia, Hawaii. I have identified the Indo Pacific Exocoetus poecilopterus Valenciennes with the present species as I have found no constant characters to separate them by.

4768, 4777 to 4781. Nogas Point, Panay. February 4, 1908. Length 275 to 310 mm.

U. S. N. M., no. 52358. Samoa. Bureau of Fisheries (04720). Length 220? mm. As Cypsilurus poecilopterus.

U. S. N. M., no. 52796. Bureau of Fisheries (03569). Length 298? mm. D. I, 11; A. II, 7; P. I, 14, with round scattered black spots terminally.

U. S. N. M., no. 55472. Bureau of Fisheries (03542). Length 290? mm. D. I, 12; A. I, 7; P. I, 14, marked with many black spots.

U. S. N. M., no. 55514. Bureau of Fisheries (02658).

Length 350 mm. D. I, 12; A. I, 8; P. I, 14.

U. S. N. M., no. 71360. Tokyo, Japan. Albatross Collection. Length 260 mm. D. I, 11; A. I, 7; P. I, 15, As Cypsilurus poecilopterus.

A. N. S. P., no. 28244. Honolulu. Dr. T. D. Wood. 1898. Stanford University.

Cypselurus spilopterus (Valenciennes)

Exocoetus spilopterus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 113, 1846 (type locality: Ovalau, Caroline Islands). -- BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 116, 1864 (Celebes); Atlas Ichth. India Neerland, vol. 6, p. 74, pl. ( ) 250, fig. 2, 1866-72 (Celebes). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 292, 1866 (copied); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 368, 1909 (Tahiti). --WEBER, Siboga Exped., vol. 57, Fische, p. 126, 1913 (between Buru and Batjan).

Cypsilurus spilopterus WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 187, 1922 (Pulu Weh; Java Sea; Gorontalo, Celebes; between Butan and Buru).

Cypselurus spilopterus FOWLER, Occas. Papers Bishop Mus., vol. 8, no. 7, p. 375, 1923 (Honolulu); Mem. Bishop Mus., vol. 10, p. 83, 1928 (Honolulu; Tahiti; Scoiety Islands).

Exocoetus poecilopterus (not VALENCIENNES) DAY, Fishes of India, pt. 3, p. 518, pl. 120, fig. 4, 1877 (part); Fauna British India,Fishes, vol. 1, p. 430, fig. 138 (copied), 1889.

Cypsilurus atrisignis JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 436, pl. 3, 1902 (1903) (type locality: Honolulu). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 136, pl. 25, 1903 (1905) (type). --JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 210, 1905 (1906) (Kusai or Strong Island, Carolines). --WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 187, 1922 (Malucca Straits).

Cypselurus atrisignis FOWLER, Mem. Bishop Mus., vol. 10, p. 83, 1928 (Ebon Island; type; Honolulu); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (Tuamotus).

Exocoetus atrisignis GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 368, 1909 (Hawaii; Ualan; Strong Island; Greenwich Island).

Depth $5\frac{1}{4}$ to 5 1/3; head 4 to 4 1/8 in width 1 3/5 to 1 4/5. Snout 3 3/4 to 4 in head from snout tip; eye 3 to 3 1/5, greatly exceeds snout, 1 2/5 to $1\frac{1}{2}$ in interorbital; maxillary reaches 3/5 to 4/5 to eye, length 4 1/3 to 4 2/3 in head from snout tip; teeth minute, simple, small, in narrow band in each jaw; interorbital 2 1/5 to 2 1/3, broad, slightly concave. Gill rakers 5 + 17, lanceolate, 1 2/5 in gill filaments which 1 3/4 in eye.

Scales 50 to 55 in lateral or axial series to caudal base and 5 to 8 more on latter; 9 above, 3 below, 39 or 40 predorsal. Scales with 4 to 7 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 12 to I, 14, first bfanched ray 1 7/8 to 2 in total head length; A. II, 7 to II, 9, first branched ray $3\frac{1}{2}$? to 3 3/4; least depth of caudal peduncle 3 1/8 to 3 1/3; pectoral rays I, 12 to I, 15, fin extends little beyond bases of last dorsal and anal rays; ventrals reach penultimate anal ray base, greatly longer than head; lower caudal lobe 3 2/5? in rest of fish.

Back olive brown, sides below and under surface silvery white. Iris silvery white. Dorsal and caudal dull brown. Pectoral dull dusky, rays paler; terminally on membranes of shorter or lower rays scattered small rounded blackish spots; lower fin edge whitish. Ventral brownish medially, broad border pale or whitish, in front and behind.

India, Malacca, East Indies, Micronesia, Polynesia, Hawaii.

Although I have previously admitted Cypsilurus atrisignis Jenkins as a distinct species, the chief character for its distinction seems to rest on the presence of the black round spot near the middle of its dorsal fin. Weber and Beaufort mention it and say of it "which may be wanting." The presence of 56 to 62 scales and D. 13 to 15, compared with scales 50 to 55 and D. 12 or 13, are hardly conclusive characters for distinction. Also 40 predorsal scales for C. atrisignis and 30 for the present species are hardly of importance.

U. S. N. M., no. 50913. Dr. O. P. Jenkins. (197). Length 330? mm. Type of Cypsilurus atrisignis. Lower gill rakers 17. Predorsal scales 41 forward to front of snout. D. II, 13; A. I, 9; P. I, 13.

U. S. N. M., no. 55171, two examples. Bureau of Fisheries (2518). Lat. 53° 41' 45" N., long. 167° 27' 20", Bering Sea. August 18, 1890. Length 330? mm.

Bureau of Fisheries (2667). Lat. 36° 48:6" N., long. 121° 47' 38"W., off Hawaii. October 11, 1891. Length 340? mm.

Two examples (with U. S. N. M., no. 55514). Bureau of Fisheries (2615). Length 310 mm. D. I, 11; A. I, 7; P. I, 14. Bureau of Fisheries (2555). Length 348 mm. D. I, 14; A. I, 10; P. I, 13. Both as Cypsilurus simus.

U. S. N. M., no. 65703. Lat. 23° 23' N., long. 129° 45' W. Albatross Collection (3165). January 12, 1892. Length 370? mm. D. I, 13; A. I, 9; P. I, 12. Lower hind pectoral edge with some scattered submarginal dark spots.

U. S. N. M., no. 89735. Near Tuamoto Islands. Pinchot Expedition. Length 408? mm. Scales 50 + 5 in lateral series; 42? predorsal. D. I, 12; A. I, 9; P. I, 12. Large black blotch on dorsal.

Cypselurus bilobatus Weber and Beaufort

Cypsilurus bilobatus WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 185, 1922 (type locality: South coast of New Guinea).

Exocoetus furcatus (not MITCHILL) WEBER, Zool. Forsch. Austral. Semon, vol. 5, p. (114) 274, 1895 (above material).

Cypselurus furcatus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 77, p. 202, 1925 (Durban beach); Mem. Bishop Mus., vol. 10, p. 83, 1928 (copied; part).

Exocoetus bahiensis (not RANZANI) BARNARD, Ann. South African Mus., vol. 22, pt. 2, p. 1022, Oct. 1927 (FOWLER'S record).

Depth 5 to 5 1/8; head 3 3/4 to 4 1/8, width 1 3/5 to 1 3/4. Snout 4 to 5 in head from snout tip; eye 2 7/8 to $3\frac{1}{4}$, greater than snout, 1 1/3 to $1\frac{1}{2}$ in interorbital; maxillary nearly or quite reaches opposite front eye edge, length 3 3/4 to 3 7/8 in head from snout tip; teeth hardly evident; each mandibular ramus with broad cutaneous flap laterally long as orbit; interorbital 2 1/3 to $2\frac{1}{2}$, broad, shallowly concave. Gill rakers 6 + 11, lanceolate, 1 2/5 in gill filaments, which 1 3/5 in iris.

Scales 42 or 43 in median lateral series to caudal base and 3 more on latter, mostly fallen and count according to pockets; 8 above, 30? predorsal. Scales with basal radiating striae, edge scalloped; 17 to 19 circuli, complete.

D. I, 12, I, first branched ray 1 1/10 to $1\frac{1}{4}$ in total head length; A. I, 8 to I, 10, first branched ray 2 to 2 2/5; least depth of caudal peduncle 3 1/8 to 3 1/5; P. I, 12 to I, 14, reaches far as middle of dorsal base or last dorsal ray base; ventral reaches far as middle of last depressed anal ray, or beyond tip of same though not quite to caudal base, fin 2 1/3 to $2\frac{1}{2}$ in entire length to caudal base; lower caudal lobe 3 1/5 to 3 3/5 in rest of body, upper lobe 1 2/5 to 1 3/5? in lower lobe.

Back brown, usually pale. Sides and lower surface silvery white, with 7 darker lateral blotches which extend across entire under surfaces; first from eye, second at pectoral base, third midway between pectoral and ventral, fourth at ventral base, fifth before dorsal, sixth above front part of anal and seventh on caudal peduncle. Barbels pale, edged blackish, also hind lobe black. Iris silvery white. Dorsal dusky to blackish, with broad white band parallel and submarginal with upper fin edge. Anal white, with dusky blotch in front and hind upper edge blackish. Caudal white, lower lobe with subterminal dark brown blotch and smaller medially; fin base with dark transverse bar. Pectoral blackish, especially terminally, edges above and below whitish, also oblique white bar before middle or nearer base. Ventral whitish, blackish over terminal 2/3 and basally dark brown blotch. Largest example shows pectoral little different or more whitish with dark basal transverse bar, another subbasal and parallel; along upper edge submarginal black blotch, another subterminal and lower inner portion of fin largely blackish. Variation also seen in ventral fin where most of inner area of fin dark to dusky.

East Indies, Philippines.

One example. Lat. 25° 10' N., long. 166° 20' W. November 3, 1907. Length 23 mm. D. I, 11. A. I, 8. Each pectoral with 3 transverse black bands, ventral with 2. Mandibular barbel nearly long as head.

D. 5226. Corregidor Light, N. 10° E., 9.50 miles (lat. 14° 12' 15"N., long. 120° 32' 24" E.), China Sea south of Corregidor. May 4, 1908. Length 70 mm.

1 example. Canimo Island near Daet. June 15, 1909. Length 19 mm.

Three examples. Jolo. Electric light. February 8, 1908. Length 16 to 31 mm. D. I, 13. A. I, 9. Pectoral brownish, blackish subterminally, not banded.

1 example. Jolo anchorage, Jolo. Electric light. March 5, 1908. Length 36 mm. No barbels.

One example. D. 5223. Malabrigo Light, W., 9.80 miles (lat. 13° 36' N., long. 121° 25' 30" E.), between Marinduque and Luzon. April 24, 1908. Length 32 mm.

One example. D. 5128. Nogas Island (W.), N. 6° E., 32.50 miles (lat. 9° 52' 10"N., long. 121° 49' 35" E.), Sulu Sea, vicinity southern Panay. February 4, 1908. Length 30? mm.

4 examples. San Miguel Bay, west side. June 14, 1909. Length 21 to 23 mm. A. I, 7. No barbels.

Six examples. D. 5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" N., long. 121° 1' 15" E.), Jolo Island and vicinity. September 19, 1909. Length 36 to 84 mm.

One example. D. 5601. Limbe Island (NE.), N., 20. 7 miles (lat. 1° 13' 10" N., long. 125° 17' 5" E.), Gulf of Tomini, Celebes. November 7, 1909. Length 24 mm. Mandibular barbel nearly 7/8 of head.

Cypselurus unicolor (Valenciennes)

Exocoetus unicolor VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 97, 1846 (type locality: Vanicolo). --BLEEKER, Verhand. Batavia. Genoot. (Snoek.), vol. 24, p. 21, 1852 (Batavia); Nat. Tijds. Nederland Indië, vol. 2, 1856, p. 95 (Banda); Act. Soc. Sci. Ind. Nëerland, vol. 1, no. 5, p. 7, 1856 (Amboina); vol. 2, no. 7, p. 8, 1857 (Amboina); vol. 3, no. 2, p. 22, 1857-58 (Japan); vol. 3, no. 4, p. 4, 1857-58 (Macassar); Nat. Tijds. Nederland Indië, vol. 13, p. 385 (Batjan); vol. 15, p. 243, 1858 (Singapore); vol. 16, p. 408, 1858 (Japara, Java); vol. 17, p. 143, 1858-59 (Boleling, Bali); Act. Soc. Sci. India Nëerland, (Sumatra), vol. 8, p. 11, 1859 (Padang; Priaman); Nat. Tijds. Nederland Indië, vol. 21, p. 331, 1860 (Cochin China).

Cypsilurus unicolor WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 189, 1922 (Java Sea, Flores, Obi). --WHITLEY, Journ. Pan Pacific Inst., vol. 3, no. 1, Jan.-Mar. 1928, p. 11 (Santa Cruz Islands).

? Exocaetus commersonii LACÉPÈDE, Hist. Nat. Poiss., vol. 5, pp. 401, 403, 1803 (no locality: on Commerson).

Exocoetus commersonii VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 102, 1846 (Maurituis; lat. 34° S. at. 40 leagues off Brazil). --GUICHENOT, Notes Ile Réunion, vol. 2, p. 29, 1862. --BLEEKER, Atlas Ichth. India Néerland, vol. 6, p. 75, 1866-72 (Banda). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference).

Exocaetus exiliens (not MÜLLER) LACÉPÈDE, Hist. Nat. Poiss., vol. 5, pp. 401, 403, pl. 12, fig. 3, 1803 (off Brazil).

Exocoetus oligolepis BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 109, 1866 (type locality: Batavia; Bali; Sumatra; Singapore; Makassar; Batjan; Amboina; Banka); Atlas Ichth. India Neerland, vol. 6, p. 69, pl. ( ) 248, fig. 3, 1866-72 (Java; Bali; Sumatra; Singapore; Celebes; Batjan; Amboina; Banda). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 296, 1866 (type). --VOLZ, Nat. Tijds. Nederland Indië, vol. 66, p. 181, 1907 (Sumatra). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 370, 1909 (Tahiti).

Exocaetus oligolepis ELERA, Cat. Fauna Filipinas, vol. 1, p. 577, 1895 (Luzon; Manila).

Cypsilurus oligolepis WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 189, 1922 (Java Sea; Batavia; Flores; Obi). --DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 42, p. 129, 1926 (near New Guinea east of Long Island).

Cypselurus oligolepis FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 263 (Orami and Orion, Philippines); Mem. Bishop Mus., vol. 10, p. 84, 1928 (compiled).

Exocoetus brachysoma BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 111, 1866 (type locality: Java; Makassar, Celebes; Labuka, Batjan; Amboina). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 295, 1866 (type; Zanzibar). --BLEEKER, Atlas Ichth. India Néerland, vol. 6, p. 70, pl. ( ) 247, fig. 1, 1866-72 (Java; Celebes; Batjan; Amboina); Rech. Faune Madagas. Pollen et Van Dam, pt. 4, p. 101, 1874 (Bourbon). --MARTENS, Preuss. Exped. Ost. Asien, vol. 1, pp. 325, 401, 1876 (between Macassar and Surabaya). --BOULENGER, Proc. Zool. Soc. London, 1877, p. 666 (Muscat). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). --VOLZ, Nat. Tijds. Nederland Indië, vol. 66, p. 181, 1907 (Priaman). --WEBER, Siboga Exped., vol. 57, Fische, p. 125, 1913 (Laiwui, Obi Major). --LAMPE, Deutsch. Sudpolar Exped., vol. 15, p. 225, 1914 (between Cape of Good Hope and Kerguelen).

Cypsilurus brachysomus JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, p. 9, 1906 (1907) (Cavite).

Cypselurus brachysoma FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, p. 13, 1922 (Cebu).

Exocoetus neglectus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 112, 1866 (type locality: Sumatra; Singapore; Batjan).

--GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 296, 1866 (type).

--BLEEKER, Atlas Ichth. India Nêerland, vol. 6, p. 71, pl. ( ) 247, fig. 2, 1866-72 (Sumatra; Singapore; Batjan).

Exocoetus socotranus STEINDACHNER, Anzeiger Akad. Wiss. Wien, vol. 39, no. 24, p. 318, Nov. 20, 1902 (type locality: between Abdal Kuri and Socotra); Denks. Akad. Wiss. Wien, mat.-nat. Kl., vol. 71, pt. 1, p. 155, 1907 (High sea between Abd-el-Kuri and Socotra).

Cypsilurus quindecimradiatus (not FOWLER) JORDAN and SEALE,

Bull. Bur. Fisher., vol. 25, p. 210, fig. 15, 1905 (1906)

(southward of Samoa).

Cypselurus ogilbyi (JORDAN and SNYDER) JORDAN and DICKERSON,

Proc. U. S. Nat. Mus., vol. 34, p. 604, fig. 1, 1909 (type

locality: west of Walpole Island, nearest land the New Hebrides).

--WHITLEY, Journ. Pan Pacific Res. Inst., vol. 2, no. 1, p. 4,

Jan.-Mar. 1927 (Fiji).

Exocoetus ogilbyi GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. ,

p. 371, 1909 (copied).

Cypsilurus bahiensis (not RANZANI) KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 253, 1911 (Arhno, Marshalls).

Cypselurus bahiensis FOWLER, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Arhno specimen).

Cypsilurus opisthopus (not BLEEKER) BEAN and WEED, Proc. U. S. Nat. Mus., vol. 42, p. 595, 1912 (Java).

Depth 5 to 5 2/3; head 3 4/5 to 4 1/8, width 1 4/5 to 1 9/10. Snout 3 3/4 to 4 in head from snout tip; eye 3 to 3 1/8, greater than snout, $1\frac{1}{4}$ to 1 1/3 in interorbital; maxillary reaches 3/5 to 7/8 to eye, length 4 to 4 3/5 in head from snout tip; teeth small, simple, conic, in narrow band in each jaw; interorbital $2\frac{1}{4}$ to $2\frac{1}{2}$, broad, shallowly depressed. Gill rakers 3 or 4 + 13 to 16, lanceolate, rather short or $\frac{1}{2}$ gill filaments, which 1 3/4 to 2 in eye.

Scales 40 to 46 in lateral axial series to caudal base and 4 to 6 more on latter; 7 or 8 above, 2 or 3 below, 32 to 38 predorsal. Scales with 4 to 6 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 10 to I, 12, first branched ray 2 1/8 to 2 2/3 in total head length; A. I, 8 or I, 9, first branched ray 3 1/10 to 3 3/4; least depth of caudal peduncle 3 1/5 to $3\frac{1}{2}$; P. I, 14, reaches opposite base of sixth branched anal ray or base of penultimate dorsal ray; ventral little shorter to longer than head, reaches opposite fourth anal ray base or nearly far back nearly far as pectoral tip; lower caudal lobe 3 2/5 to 3 7/8 in rest of fish, upper lobe $1\frac{1}{4}$ to 1 1/3 in head.

Back olive brown, sides and lower surfaces silvery white. Iris silvery white. Dorsal and caudal pale brownish. Anal whitish. Pectoral dusky, paler subbasally and darker terminally. Ventral brownish medially, edges broadly paler or whitish, especially inner margins.

Arabia, Zanzibar, Maurituis, Reunion, Bourbon, Malaya, East Indies, Philippines, Cochin China, Japan, Melanesia, Micronesia and Polynesia. Also in the Atlantic. I have admitted the present species with the description by Valenciennes chiefly as it is described with "D. 13; A. 11". Moreover it is described with "les pectorales, d'un gris violacé, n'ont ni la tache blanche ni la bordure de la précédente" [Exocoetus speculiger] . While all my specimens of the present species show a more or less pale area on the pectoral subbasally below it is sometimes quite inconspicuous or little evident.

There is little doubt that Exocoetus socotranus Steindachner, determined alternately as well as doubtfully E. brachysoma Bleeker, is this species. It is described with D. 10, A. 8, scales 50, based on an example 210 mm.

9090 to 9097. Catbalogan Anchorage, Samar. April 15, 1908. Length 158 to 178 mm. 8 examples.

7776 to 7779. Catbalogan Abchorage. April 17, 1908. Length 157 to 168 mm.

15488 [1485] . Cebu market. March 26, 1909. Length 200 mm.

13969 to 13971. Nato, Luzon. June 19, 1909. Length 167 to 185 mm.

4642. Port Binanga, Subig Bay. January 8, 1908. Length 177 mm.

11554 to 11560. San Miguel Bay. June 15, 1909. Length 152 to 170 mm.

4555, 4556. Subig Bay, Subig. January 6, 1907. Length 150 to 180 mm.

One example. Ulugan Bay. December 27, 1908. Length 203 mm.

U. S. N. M. no. 52348. Apia, Samoa. Bureau of Fisheries. Length 392 mm.

D. I, 12; A. I, 9; P. I, 13. As Cypsilurus unicolor.

U. S. N. M., no. 52669. Bureau of Fisheries (03539).

Length 248 mm. D. II, 11; A. II, 6; P. I, 14.

U. S. N. M. no. 55171. East of Hawaii. Bureau of Fisheries (2644). lat. 48° 28' 5"N., long. 124° 36' 55" W. August 28, 1891. Length 280 mm.

Bureau of Fisheries (2647). lat. 48° 25' 30" N., long. 124° 42' 15" W. September 1, 1891. Length 275 mm.

Bureau of Fisheries (2645). lat. 48o 24' 25" N., long. 124° 37' 45" W. August 29, 1891. Length 263 mm.

Bureau of Fisheries (2646). lat. 48° 27' 10" N., long. 124° 39' 50" W. August 29, 1891. Length 275 mm.

U. S. N. M. (two examples with no. 55514). Bureau of Fisheries (2642). Length 275 mm.

Bureau of Fisheries (2643). lat. 25° 25' N., long. 79° 55' 15" W., West Indies. In 211 fathoms. Aprill 9, 1885. Length 260 mm.

U. S. N. M., no. 56116. Lat. 36° 48' N., long. 121° 53' 50" W., off central California. In 138 fathoms. Bureau of Fisheries (3203). April 11, 1890. Length 235 mm. D. I, 11; A. I, 8; P. I, 12; scales 48 + 6, 38 predorsal. As Cypselurus simus.

U. S. N. M., no. 65809. Arhno, Marshalls. Albatross Collection (A184). Length 310 mm. D. I, 11; A. I, 8; P. I, 14; gill rakers 4 + 18. As Cypsilurus bahiensis.

U. S. N. M., no. 72565. Batavia, Java. O. Bryant and W. Palmer. April 2, 1909. Length 195 mm. As Cypsilurus opisthopus.

U. S. N. M., no. 84191. Philippines. Dr. Fred Baker. Length 143 mm. As Cypselurus brachysoma.

A. N. S. P., no. . Honolulu. Dr. T. D. Wood. 1898. Stanford University. Length 330 mm.

A. N. S. P.,no. 51338. Madras. 1922. Department of Fisheries of Bengal.

Cypselurus bahiensis (Ranzani)

Exocoetus bohiensis RANZANI, Nov. Comm. Acad. Sci. Inst. Bonon., vol. 5, p. 362, pl. 38, 1842 (type locality: Brazil). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 293, 1866 (Sumatra; Atlantic). --BLEEKER, Atlas Ichth. India Néerland, vol. 6, p. 71, 1866-72 (Sumatra). --KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. , p. 585, 1871 (Red Sea). --LÜTKEN, Vidensk. Medd. Natur. Foren. Kjöbenhavn, p. 402 (108), 1876 (Indian Ocean). --DAY, Fishes of India, pt. 3, p. 519, pl. 121, fig. 10, 1877. --BLEEKER, Verhand. Kon. Akad. Wet. Amsterdam, vol. 18, p. 3, 1879 (Shanghai). --JORDAN and MEEK, Proc. U. S. Nat. Mus., vol. , p. 64, 1885 (copied).

--DAY, Fauna British India, Fishes, vol. 1, p. 431, 1889. --STEINDACHNER, Denks, Akad. Wiss. Wien, math. -nat. Kl., vol. 70, pt. 1, p. 512, 1900 (Honolulu). --VOGT, Nat. Tijds. Nederland Indië, vol. 66, p. 180, 1907 (Podang). --GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 369, 1909 (Hawaii; Sumatra; Misol). --GILCHRIST and THOMPSON, Ann, South African Mus., vol. 6, pt. 3, p. 266, 1909 (Natal). --WEBER, Siboga Exped., vol. 57, Fische, p. 125, 1913 (lat. 4° N., long. 126° E.). --GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 311, 1917 (compiled). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 269, June 1925 (Natal).

Cypsilurus bahiensis JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 432, 1902 (Honolulu). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 136, 1903 (1905) (Hilo; Honolulu). --WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 190, 1922 (Pulu Weh, Molucca Straits). --CHU, Biol. Bull. St. John's Univ., no. 1, p. 88, Jan. 1931 (reference).

Cypselurus bahiensis FOWLER and BALL, Bull. Bishop Mus., vol. 26, p. 8, 1925 (Lisiansky). --FOWLER, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Honolulu; Lisiansky; Hawaiian Islands; types of Cypselurus tahitensis and Cypsilurus quindecemradiatus; not Arhno specimen); vol. 11, no. 5, p. 319, 1931 (compiled); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (Cocos Island); Hong Kong Nat., vol. 3, nos. 3-4, p. 277, fig. 20, Dec. 1932 (Micronesia, Polynesia, Hawaii, Atlantic).

Exocoetus cyanopterus VALENCIENNES, Hist. Nat. Poiss., vol. 19, p. 97, 1846 (type locality: Bahia; Rio Janeiro).

--GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 294, 1866 (copied).

--JORDAN, Proc. U. S. Nat. Mus., 1886, p. 528 (type). --BARNARD, Ann. South African Mus., vol. 21, pt. 1, p. 270, June 1925 (Agulhas Bank).

Exocoetus vermiculatus POEY, Memor. Cuba, vol. 2, p. 300, 1861 (type locality: Cuba).

Exocoetus albidactylus GILL, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 167 (type locality: Caribbean Sea [Panama erroneous).

Exocoetus spilonotopterus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 113, 1863 (type locality: Padang, Sumatra); Atlas Ichth. India Neerland, vol. 6, pl. (3) 249, fig. 2, 1866-72.

Cypsilurus spilonotopterus JORDAN and DICKERSON, Proc. U. S. Nat. Mus., vol. 34, p. 606, fig. 2, 1903 (type locality: Hawaiian Islands). --JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, p. 176, 1909 (copied).

Cypselurus spilonopterus JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, p. 243, 1907 (1908) (Negros). --WHITLEY, Journ. Pan Pac. Inst., vol. 2, p. 4, Jan. - Mar. 1927 (Fiji); vol. 3, no. 1, p. 11, Jan. - Mar. 1928 (Santa Cruz Islands).

Exocoetus parrae POEY, Synop. Pisc. Cub., p. 385, 1868.

Cypsilurus quindecimradiatus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1899, p. 482, pl. 17 (type locality: Thornton Island [wrongly Caroline Islands]).

Cypselurus quindecimradiatus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 15 (type).

Exocoetus quindecimradiatus GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 370, 1909 (copied).

Cypselurus tahitensis SEALE, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 13, fig. 3, 1906 (type locality: Tahiti).

Exocoetus tahitensis GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 14, p. 371, 1909 (copied).

Depth 5 to 5 3/4; head 4 1/8 to 4½, with 1 4/5 to 1 7/8. Snout 3 1/5 yo 3½ in head from snout tip; eye 3 3/5 to 4, slightly greater than snout to 1 1/8 in snout with age, 1 1/5 to 1 3/4 in interorbital; maxillary reaches 3/4 to 2/3 to eye, length 4 to 4 1/8 in head from snout tip; teeth very small, simple, conic, in bands in jaws, of 4 or 5 rows transversely in front, narrowing to 1 or 2 rows at sides of jaws; interorbital 2½ to 2 2/3, broad, slightly or shallowly concave. Gill rakers 5 + 17, lanceolate, 1½ in gill filaments, which 1 2/3 in eye.

Scales 46 to 50 in median lateral series to caudal base and 4 to 6 more on latter; 8 above, 3 below, 40 or 41 predorsal. Scales with 6 or 7 basal radiating striae, edge scalloped; circuli very fine complete.

D. I, 13, first branched ray 1 3/5 to 2 in total head length; A. II, 8 to I, 10, first branched ray 2 4/5; least depth of caudal peduncle 3 to 3 1/5; P. I, 14 or I, 13, reaches nearly or quite to caudal base; ventral reaches middle or slightly beyond middle of anal base; lower caudsl lobe 3 1/6 in rest of body.

Back brown, sides below and under surfaces silvery white. Iris silvery white. Dorsal and caudal brown, former with large black spot, well contracted, anteromedially on fin. Pectoral with membranes deep to dusky brownish, blackish terminally.

Red Sea, Natal, India, East Indies, Philippines, China, Polynesia, Hawaii. The largest species in owt collection. It always shows a uniform pectoral in combination with the black spot on the dorsal. In this way it may be easily distinguished from Cypselurus spilopterus.

I am unable to find any characters on which to separate Exocoetus cyanopterus Valenciennes. The distinctions given by Barnard as A. 9 or 10 for C. bahiensis and A. 11 or 12 for C. cyanopterus are overreached by materials I have studied.

4773, 4775, 4782. Nogas Point, Panay. February 4, 1908. Length 300 to 357 mm.

U. S. N. M., no. 52660. Bureau of Fisheries (03567). Length 458 mm.

U. S. N. M., no. 89732. Cocos Island. Pinchot Expediton. Length 413 mm.

A. N. S. P., no. 53192. Chatham Bay, Cocos Island. 1929. Dr. H. A. Pilsbry. Pinclot Expedition.

Cypselurus hallbergi Fowler

Cypselurus hallbergi FOWLER, Journ. Bombay Nat. Hist. Soc., vol. 32, no. 4, p. 705, pl. 1, 1928 (type locality: Ceylon).

Depth 5¼; head 4½, width 1 3/5. Snout 3½ in head from snout tip; eye 3½, greater than snout, 1 1/5 in interorbital; maxillary reaches 4/5 to eye, length 3½ in head from snout tip; interorbital 2 1/3, very slightly concave. Gill rakers 7 + 21, lanceolate, equal gill filaments or 1 7/8 in eye.

Scales 47 in axial lateral series to caudal base and 3 more on latter; 8 above, 3 below, 30 predorsal, extend forward little before nostril. Scales with 5 or 6 basal radiating striae, edge lobate; circuli fine.

D. I, 11, I, first ray 2¼ in total head; A. I, 9, I, first branched ray 3 1/8, origin opposite base of second branched dorsal ray; least depth of caudal peduncle 3; upper caudal lobe 1 1/3 in lower, which 3¼ in rest of fish; pectoral 1½, not quite reaching caudal base, rays IV, 13; ventral I, 5, length 2 4/5, origin midway between hind eye edge and caudal base.

Back deep brown, lower sides and under surfaces whitish. Iris slate. Lower jaw pale. Dorsal and caudal pale brown. Anal whitish. Pectoral neutral brown medially, terminally dusky, pale basally and lower basal margin whitish. Ventral neutral brown medially and terminally, with broad inner whitish border, base and spine also pale.

Ceylon. Only known from the type, unique in the presence of 4 simple pectoral rays.

A. N. S. P., no. 51323, type. Ceylon. 1922. Dr. F. Hallberg. Length 195 damaged (207 total) mm.

Cypselurus opisthopus (Bleeker)

Exocoetus opisthopus BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 121, 1866 (type locality: Celebes). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 297, 1866 (type; Amboyna). --BLEEKER, Atlas Ichth. India Néerland, vol. 6, p. 76, pl. ( ) 248, fig. 2, 1866-72 (Celebes; Amboina). --WEBER, Siboga Exped., vol. 57, Fische, p. 125, 1913 (Saleyer; Banda).

Cypsilurus opisthopus WEBER and BEAUFORT, Fishes Indo Austral. Arch., vol. 4, p. 191, 1922 (Flores; Ambon; Banda).

Cypselurus opisthopus FOWLER, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Shortland Island).

Cypselurus oligolepis (not BLEEKER) SEALE, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 15, 1906 (Shortland Island).

Depth 4 4/5 to 5; head 4 to 4¼, width 1 3/5 to 1 2/3. Snout 3 3/5 to 3 7/8 in head from snout tip; eye 3 1/10 to 3¼, much greater than snout, 1 1/5 to 1 1/3 in interorbital; maxillary reaches 3/4 to 4/5 to eye, length 3 4/5 to 4 2/3 in head from snout tip; teeth very small, pointed, form narrow bands in jaws; interorbital 2 3/4 to 2 7/8, broad, nearly level or only very slightly depressed. Gill rakers 4 + 16, lanceolate, ½ of gill filaments, which 1 7/8 in eye.

Scales 45 to 46 in lateral or axial series to caudal base and 3 or 4 more on latter; 8 above, 2 below, 31 to 37 predorsal. Scales with 3 or 4 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 10 or I, 11, first branched ray 2 1/10 to 2¼ in total head length; A. I, 7 or I, 8, first branched ray 3 2/5 to 4; least depth of caudal peduncle 3 1/5 to 3¼; pectoral rays I, 13 or I, 14, fin reaches ½ to 3/5 in dorsal base; ventral 3 2/3 to 3 7/8 in body from mandible tip to caudal base, reaches beyond base of last anal ray though not to its tip; lower caudal lobe 3 1/10 to 3 1/5 in rest of fish, upper lobe 1 1/3 to 1½ in lower.

Back and upper surfaces brown, sides and below silvery white. Sides of body with coppery brown tinge. Iris brownish to whitish. Dorsal pale brownish, caudal little darker. Anal whitish. Pectoral largely blackish brown above, narrowly along upper edge and broadly along lower portion whitish; folded fin with median rays edged with silvery gray, giving lighter tint to fin medially. Ventral whitish, brownish submarginally in front.

East Indies, Melanesia. An interesting and well marked species, known by the posterior insertion of the ventrals much nearer caudal base than gill opening. Its pectoral is also much more contrasted than the uniform brown pectoral of Bleeker's figure.

4904. Camp Overton, Mindanao. August 5, 1909. Length 223 mm.

8017, 8018. Catbalogan, Samar. April 16, 1908. Length 193 to 215 mm.

Cypselurus agoo (Schlegel)

Exococtus agoo SCHLEGEL, Fauna Japonica, Poiss., pt. , p. 247, 1846 (type locality: Seas of Japan). (Error.)

Exocoetus agoo BLEEKER, Verh. Batavia, Genoot. (Japan.), vol. 25, p. 18, 1853 (Agoo). --ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, p. 18, 1897 (reference).

Cypselurus agoo JORDAN and SNYDER, Annot. Zool. Japon., vol. , p. 60, 1901 (Yokohama). --FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 15 (Tsuruga; Yokohama; Miyako). --JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, no. , p. , 1925 ( ). --SCHMIDT, Trans. Pac. Comm. Acad. Sci. U. S. S. R., p. 35, 1931 (Nagasaki).

Cypsilurus agooJORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 26, p. 541, fig. 3, 1903 (Tsuruga, Nagasaki, Tokyo, Myiako, Hiroshima, Hakata, Onomichi, Aomori). --ANONYMOUS, Illust. Jap. Aquat. Pl. Animals, vol. 1, pl. 21, fig. 10, 1931.

Exocoetus doderleinii (STEINDACHNER) STEINDACHNER and DÖDERLEIN, Denks. Akad. Wiss. Wien, vol. 49, pt. 1, p. 294, 1885 (type locality: Tokyo).

Cypselurus doderleinii JORDAN and SNYDER, Annot. Zool. Japon., vol. , p. 60, 1901 (Yokohama).

Depth 5 1/5 to 6¼; head 4 1/3 to 4 7/8, width 1½ to 1 4/5. Snout 3 1/3 to 4 1/3 in head from snout tip; eye 3 1/3 to 3 3/4, greater than snout to subequal with age, 1 2/5 to 1 3/5 in interorbital; maxillary reaches 3/5 to 2/3 in snout, length 4 1/8 to 4 3/4 in head; teeth fine, short, conic, very small, in narrow bands in jaws; interorbital 2 2/5 to 2½, broad, shallowly concave. Gill rakers 6 + 15, lanceolate, ½ gill filaments, which 1 1/3 in eye.

Scales 50 to 55 in median lateral series to caudal base and 5 to 8 more on latter; 8 to 10 above lateral line, 4 below, 42 to 48 predorsal. Scales with 3 to 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 11, I or I, 12, I, first branched ray 1 3/4 to 2 1/10 in total head; A. I, 8, I to I, 11, I, first branched ray 3 to 3½; least depth of caudal peduncle 2 7/8 to 3 2/3; P. I, 15, reaches beyond bases of last dorsal and anal rays, sometimes beyond tips though not to caudal base; ventral little longer than head, reaches fifth anal ray base.

Back brown, sides and under surface whitish to silvery white. Iris silvery white. Dorsal and caudal brownish, former sometimes darker brownish terminally. Pectoral with membranes becoming dark brown terminally. Ventral

Japan.

U. S. N. M., no. 22540. Idzu. Japanese Government. Length 444 mm.

U. S. N. M., no. 44931. Japan. Japanese Government. Length 398? to 405 mm. Two examples.

U. S. N. M., no. 50736. Tokyo. D. S. Jordan and J. O. Snyder. Length 270 to 310 mm. Four examples.

U. S. N. M., no. 50737. Tsuruga, Echizen. Length 230 to 258 mm.

U. S. N. M., no. 53535. Yakushima, Kagoshima, Japan. June 3, 1905. Robert Anderson. Length 320? mm.

U. S. N. M., no. 57634. Japan. P. L. Jouy. Length 270? mm.

U. S. N. M., no. 57635. Japan. P. L. Jouy. Length 245 to 260? mm. Three examples.

U. S. N. M., no. 57636. Japan. P. L. Jouy. Length 230 to 245? mm. Two examples.

A. N. S. P., nos. 31716 to 31718. Tsuruga, Japan. Stanford University. In exchange. Length to mm. Three examples.

A. N. S. P., no. 28240 to 28241. Yokohama. Stanford University. In exchange. Length to mm. Two examples.

A. N. S. P., no. 31735. Miyako. Stanford University. In exchange. Length mm.

Cypselurus nigripennis (Valenciennes)

Exocoetus nigripennis VLAENCIENNES, Hist. Nat. Poiss., vol. 19, p. 108, 1846 (type locality: China Seas). --BLEEKER, Verh. Batavia, Gen. (Snoek.), vol. 24, p. 27, 1852 (Pinang); Act. Soc. Sci. India Néerland, no. 7, vol. 2, p. (8) 86, 1857 (Amboina); Nat. Tijds. Nederland Indië, vol. 22, p. 99, 1860 (New Guinea).

Exocoetus nigripinnis BLEEKER, Nederland Tijds. Dierk., vol. 3, p. 120, 1866 (Singapore; Amboina; New Guinea). --GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 298, 1866 (part). --BLEEKER, Atlas Ichth. India Nêerland, vol. 6, p. 70, pl. (5) 251, fig. 1, 1866-72 (Sinagpore; Pinang; Amboina; New Guinea); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 272, 1868 (Guebe, Moluccas). --MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 188, 1881 (Western Australia; Warrior Reef). --SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). --STEINDACHNER, Abhandl. Senckenberg. Ges., vol. 25, p. 452, 1900 (1901) (Ternate). --DUNCKER, Mitteil. Naturh. Mus. Hamburg, vol. 21, p. 171, 1903 (1904) (compiled).

Exocelus nigripinnis ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, p. 350, 1876 (Warrior Reef; error).

Exocaetus nigripinnis SAVILLE KENT, Great Barrier Reef, pp. 299, 370, 1893 (Queensland).

Cypsilurus nigripennis WEBER and BEAUFORT, Fishes Indo . Austral. Archip., vol. 4, p. 192, 1922 (Bleeker's specimens).

Cypselurus nigripennis FOWLER, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Shortland Island).

Depth 4 2/3 to 5¼; head 3 7/8 to 4¼, width 1 1/3 to 1 2/5. Snout 3¼ to 4 in head from snout tip; eye 2 7/8 to 3, much greater than snout, 1 1/3 to 1 2/5 in interorbital; maxillary reaches front edge of iris; length 3½ to 3 3/4 in head from snout tip; teeth as very minute points along edges of jaw; interorbital 1 7/8 to 2 in head from snout tip, broad, shallowly concave. Gill rakers 6 + 17, lanceolate, 1½ in gill filaments, which 1½ in iris.

Scales estimated about 38? in lateral or axial series to caudal base and 4 more on latter, little developed and most all now fallen.

D. I, 10 or I, 11, second branched ray 1 4/5 to 2 in total head length; A. I, 7, first branched ray 1 7/8 to 2; least depth of caudal peduncle 3 to 3½; pectoral rays I, 13, uppermost or simple ray short and separated from rest of fin by broad membrane, fin reaching about middle of dorsal base; ventral half of body without caudal, reaches caudal base; lower caudal lobe 2 1/8 to 3¼ in rest of body, upper lobe 1 2/5 to 1 2/3 in lower lobe.

Pale brown generally, under surface with silvery sheen punctuated with deep or dusky brown. Dark brown blotch below each eye. Vertical fins whitish; dorsal terminally above with dusky blotch; caudal with gray blotch terminally on lower lobe, another paler and smaller medially, besides still third basally; at base of upper caudal lobe short oblique well contrasted blackish bar. Paired fins largely blackish, though pectoral usually, or at least in largest specimen of series show whitish transverse band at basal third of fin, also one or more large darker nebulous areas or blotches on remaining outer portions of fin.

Pinang, Singapore, East Indies, China, Western Australia, Melanesia. Compared with Bleeker's rather crude figure of Exocoetus nigripinnis my specimens differ in many ways. He shows the vertical fins blackish, though the caudal with a slightly paler oblique bar from the base of the upper lobe down to the lower lobe; the position of the ventral fin also more advanced so the depressed fin would fall well short of the caudal base. The white pectoral band of some of the larger young specimens seem to suggest the possibility of the identity of Cypselurus arcticeps.

Exocoetus nigripennis Valenciennes is described with D. 12, A. 10, paired fins black, caudal yellowish, body above brown, below white. Length 88 mm.

One example. D.5539. Apo Island (C.), N. 78° W., 8.2 miles (lat. 9° 3' 20" N., long. 123° 24' 45" W.), between Negros and Siquijor. August 19, 1909. Length 34 mm.

Two examples. D.5540. Apo Island (C.), N. 76° W., 8.1 miles (lat. 9° 3' 00" N., long. 123° 24' 30" E.). August 19, 1909. Length 26 to 28 mm.

One example. Lat. 25° 10' N., long. 166° 20' W. November 3, 1907. Length 19 mm.

Forty-one examples. D.5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" N., long. 121° 1' 15" E.), Jolo Island vicinity. September 19, 1909. Length 20 to 58 mm.

Eight examples. Kowloon, China. Electric light. September 14, 1908. Length 28 to 45 mm.

Cypselurus brevis WEBER and Beaufort

Cypsilurus brevis WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 192, 1922 (type locality: Saleyer; Aru Islands).

Depth 4 to 4½; head 3 9/10 to 4. Snout somewhat shorter than eye, upper profile gently sloping downward in straight line from eye to snout tip; eye 3, slightly less than postorbital which equals interorbital; teeth minute, conic, several rows in jaws, none on palate.

Scales 49 to 52 in lateral series; 8 above, 3 below, 27 predorsal.

D. 12 or 13, distant from first rudimentary caudal rays space little more than head length; A. 9, origin below sixth dorsal ray; caudal deeply forked; pectoral ray I, 14; ventral rays 6, reach middle of anal, longer than head, origin midway between hind preopercle edge and caudal base.

Dark above, silvery below. Doral and caudal dusky. Anal and vertrals white with outer rays of latter somewhat dusky. Pectoral dusky above, hyaline below, reddish brown in axis. Length 256 mm.

East Indies. Weber and Beaufort say "allied to C. bahiensis and C. oligolepis, from both of which it differs through the absence of teeth on the palate. It is more over distinguished from C. bahiensis by its greater height, smaller teeth, less blunt profile of snout, and from C. oligolepis by its simple, not tricuspid teeth and smaller scales."

Cypselurus gilberti (Snyder)

Exonautes gilberti SNYDER, Bull. U. S. Fish Comm., vol. 22, 1902, p. 522, pl. 7, fig. 12 (1904) (type locality: near lat. $28\frac{1}{2}^{o}$ N., long. 140^{o} W., north east of Honolulu). --JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 134, pl. 24, 1903 (1905) (type). --JORDAN and DICKERSON, Proc. U. S. Nat. Mus., vol. 34, p. 607, 1908 (note).

Cypsilurus gilberti JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 209, 1905 (1906) (reference).

Exocoetus gilberti GÜNTHER, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 371, 1909 (copied).

Cypselurus oxycephalus (not BLEEKER) FOWLER, Mem. Bishop Mus., vol. 10, p. 81, 1928 (type of Exonautes gilberti).

Depth 7; head 4 3/4, width 1 2/3. Snout 4 7/8 in head from snutt tip; eye 3, greater than snout, 1 1/5 in interorbital; maxillary reaches 3/4 to eye, length 4 1/8 in head from snout tip; teeth minute, simple, in narrow band in each jaw, narrower posteriorly or at sides of jaw; interorbital $2\frac{1}{2}$, broad, shallowly concave. Gill rakers 7 + 18, lanceolate, subequal with gill filaments or $\frac{1}{2}$ of eye.

Scales 48 from above gill opening to caudal base and 6 more on latter; 6 above, 3 below, 36 predorsal. Scales with 5 or 6 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 9, I, first branched ray 1 4/5 to total head length; A. I, 9, first branched ray 2 2/3; least depth of caudal peduncle 3 2/3; pectoral rays II, 16, fin reaches beyond dorsal and anal, though not quite to caudal base; ventral reaches little beyond base of seventh anal ray; lower caudal lobe 3 2/5 in rest of body; upper caudal lobe 1 1/8 in total head.

Olive brown on back and above, sides below and under surfaces silvery white. Iris silvery white, also mandible. Dorsal and caudal brownish, or like back. Anal whitish. Pectoral largely dusky, rays outside basally pale, fin terminally blackish, though its lower hind edge narrowly pale. Ventral brownish medially, greater inner edges whitish.

Hawaiian Islands. This species is closely related to Cypselurus rondeletii in having its first 2 pectoral rays simple. That species differs, howerer, in having 12 or 13 anal rays.

U. S. N. M., no. 50872, type. Lat. 26° 50' N., long. 140° W. Albatross Collection (2491). Length 265 mm.

Cypselurus naresii (Günther)

Exocoetus naresii GUNTHER, Rep. Voy. Challenger, vol. 31, p. 36, pl. 1, fig. a, 1888 (1889) (type locality: between Fiji and New Hebrides); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 365, 1909 (type). --WEBER, Siboga Exped., vol. 57, Fische, p. 128, 1913 (between Gebe and Fau).

Cypsilurus naresi WEBER and BEAUFORT, Fishes Indo Austral. Archip., vol. 4, p. 188, 1922 (Weber's material).

Cypselurus naresii FOWLER, Mem. Bishop Mus., vol. 10, p. 84, 1928 (copied).

Depth 5 2/3 to 6 2/3; head 3 2/3 to 3 3/4, width 2 to 2 1/10. Snout 4 to 4 2/5 in head from snout tip; eye 3 to 3 1/5, much greater than snout, $1\frac{1}{4}$ to 1 1/3 in interorbital; maxillary reaches 4/5 or to eye, length $3\frac{1}{2}$ to 4 in head from snout tip; mandibular barbel 2 2/5 to 2 3/5 in body with caudal, broad, band like; teeth scarcely evident; interorbital 2 2/5 to 2 4/5 in head from snout tip, broad, nearly level. Gill rakers 5 + 14, lanceolate, slender, $1\frac{1}{4}$ in gill filaments, which $2\frac{1}{2}$ in eye.

Scales 37 or 38 in lateral or axial series to caudal base and 4 more on latter, estimated from pockets. (all scales now fallen); 24 predorsal.

D. I, 10, second branched ray 2 in total head length; A. I, 7, first branched ray 1 7/8 to 2; least depth of caudal peduncle 3 to 4 1/5; pectoral rays I, 11 to I, 13, fin reaches $\frac{1}{2}$ to 7/8 in dorsal base; ventral reaches 2 1/3 to 2 3/5 in space between mandible tip and caudal base, extends slightly beyond caudal base; lower caudal lobe 3 2/5 to 3 2/3 in rest of body, upper caudal lobe 2 in lower lobe.

Brown above, sides whitish and under surface grayish dusky, soiled or darker on belly. Iris silvery gray. Band like barbel black with narrow white midrib. Vertical fins whitish. Dorsal grayish terminally. Caudal with faint gray blotch at end of lower lobe, another medially and third basal, also dusky black area at base of upper lobe. Pectoral with upper and lower edges whitish, medially black. Ventral black, edges paler.

East Indies, Polynesia. Günther's speciman was 175 mm. long. His description and figure agree in most all details, though the last dorsal and anal rays are said to be blackish.

Six examples. D.5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" N., long. 121° 1' 15" E.), vicinity of Jolo. September 18, 1909. Length 23 to 64 mm.

Cypselurus spilurus (Günther)

Exocoetus spilurus GÜNTHER, Cat. Fishes Brit. Mus., vol. 6, p. 285, 1866 (no locality).

Cypsilurus spilurus DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 42, p. 128, figs. 1-3, 1926 (east Long Island, New Guinea).

Cypselurus spilurus FOWLER, Mem. Bishop Mus., vol. 10, p. 85, 1928 (compiled).

Depth not more than head length, which short and thick. Snout very short; eye very large; interorbital space wide, concave.

Single flat barbel at chin, half as long as head. D. 11, fin moderately elevated, last rays reaching caudal; A. 8; pectoral extends to ventral root; ventral reaches caudal, origin midway between head and caudal root. Upper parts transparent, colorless, lower parts brown. Small black spot at base of barbel, larger one in middle of ventral root. Upper part of gill opening black. Pectoral colorless, with triangular black spot at base. Ventral and anal fins black. Length 63 mm.

(Günther.)

East Indies. Duncker and Mohr have figured two examples, 32 and 17 mm. long.

Cypselurus caudimaculatus new species

Depth 6½ to 6 7/8; head 4 1/5 to 4 1/3, width 1 3/5 to 1 3/4. Snout 3 1/5 to 4 in head from snout tip; eye 3 1/8 to 3¼, greater than snout, 1½ in interorbital; maxillary reaches 3/4 or to eye, length 3 4/5 to 4 1/8 in head from snout tip; teeth very minute, simple, conic, in narrow bands in jaws; befid barbel at symphysis of mandible long as eye; interorbital 2 1/3 to 2 2/5 in head from snout tip, broad, shallowly concave. Gill rakers 6+ 17, lanceolate, 1½ in gill filaments, which 1 2/3 eye.

Scales 39 to 42 in median lateral series to caudal base and 4 more on latter, mostly fallen and counted largely from pockets; 27 or 28 predorsal to occiput. Scales with 2 or 3 basal radiating striae, edge scalloped; circuli 16 to 22, complete.

D. I, 8 to I, 10, seventh ray 1 2/5 to 2 in total head length; A. I, 6 or I, 7, first branched ray 2 to 2 1/8; least depth of caudal peduncle 3 1/8 to 3 3/5; P. I, 13, fin reaches 1/8 in ventral or 2 1/10 to 2 1/3 in total length to caudal base; ventral inserted little nearer caudal than gill opening, reaches slightly beyond caudal; lower caudal lobe 4 1/8 to 4¼ in rest of fish, upper lobe about half of lower.

Back brown, belly and under surfaces dusky to smutty, often with grayish cast. Head often dusky coppery below. Iris gray or coppery silvery. Dorsal pale, dusky to blackish posteriorly, also anal. Anal white, with medial basal blackish blotch. Pectoral whitish, with black basal blotch and larger one terminally. Ventral black. Barbel blackish.

Diagnosis. Suggestive of Cypselurus nigripennis (Valenciennes) but that species without barbels and its fins largely blackish. Known from most small flying fish by the black basal spot on its pale caudal. It somewhat siggests Exocoetus spilurus Günther, though it is described with "a single flat barbel at the chin, half as long as the head" and with different coloration.

Type. -- U. S. N. M., no.

Eight examples. D.5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" N., long. 121° 01' 15" E.), Jolo Island and vicinity. September 19, 1909. Length 47 to 62 mm. Type. 75 mm.